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REASONS FOR OPTIMISM IN THE CARE OF THE SICK*

BY W. B. CANNON, M.D.†

THAT you, a group of physicians who are daily confronting the practical problems of sick men and women, should ask me, a physiologist, a laboratory recluse, to address you is a rather surprising fact. Perhaps my presence here calls for some explanations from you—and for some apologies from me! Since you are not in a position to explain, I shall take occasion immediately to make my apologies. I cannot report cases, for I do not see patients. I cannot offer you any helpful hints about particular difficulties, because, primarily, I do not know those difficulties. I cannot discuss the characteristics of the diseases with which you are concerned; that is a service of the pathologist and I am no pathologist. All that I propose to do as a physiologist is to draw forth some suggestions from years of research and reading and thinking about the workings of the organism that seem to me of interest to us all as students of bodily function and that may be useful as laying a basis for optimism in medical practice.

In looking back on more than a quarter-century of physiological investigation I note a common idea running through many of the studies. This idea I was not aware of until a few years ago. Then I began to realize that a considerable number of the researches which had been carried on in the laboratory were concerned with the factors which make for stability of the organism. If we think for a moment that we are composed of most complex and delicately poised material structures, that agencies are at work at all times tending to break them down, that only a momentary check in the flow of oxygen to cells in the brain results in profound disturbances of their action, that when the intricate processes of the living creature cease disintegration almost immediately sets in—when we carefully consider these familiar facts the astounding marvel of the stability of the organism begins to dawn upon us. Let us look at some of these provisions for constancy.

A proper supply of water in the body is of fundamental importance. It is needed to help lubricate the moving parts, to keep the normal consistency of the blood, to serve as a vehicle for excreted waste, to provide for the digestive secretions, to carry food through the intestinal wall, to prevent a rise of body temperature. We are constantly losing water through the lungs, the skin and the kidneys. What happens if the supply runs low? Studies show that the water content of the blood is maintained at the expense of various organs. Among these organs are the salivary glands. They need water for their secretion, because saliva is about 99 per cent. water. If the water supply is short, the salivary glands fail to keep the throat moist and a disagreeable sensation, thirst, consequently arises,—so insistent, so imperious and compelling that men will fight to quench it. Soon after water is taken the salivary glands start their service again and the tormenting sensation disappears (see Cannon, 1918). Thus automatically the water content of the body is provided for, and the disturbances due to water deficiency are corrected.

Another instructive illustration is seen in the control of blood sugar. The normal level is about 100 mg. per 100 cc. of blood, or "100 mg. per cent.," as it is commonly expressed. If it rises above 170 mg. per cent. sugar is lost through the kidneys; if it falls to about 45 mg. per cent. convulsions occur. The importance of keeping the variations of the sugar percentage within bounds is obvious. How is that managed? If the level rises, as it does when carbohydrate food is eaten in abundance, the vagus nerves are stimulated, according to present evidence, and the islands of Langerhans secrete into the blood stream their product, insulin, which causes the extra sugar to be stored or more rapidly utilized. Thus the height to which the level rises is limited. If, on the other hand, the percentage falls, at a critical point when there are about 70 mg. per cent. the sympathetic nerves are stimulated, and these nerves in co-öperation with the adrenal glands liberate sugar from the liver. If this does not suffice to protect against the danger of a too low sugar content in the blood, the convulsion which ensues as the sugar level drops is accompanied by a maximal stimulation of the liver cells to discharge glucose. In this way the organism automatically restricts the range over which the percentage of sugar in the blood may shift. When conditions push the percentage in one direction a neuro-endocrine agency comes into play and resists the push, and when other conditions push the percentage in the other direction another neuro-endocrine agency operates to resist that push. Thus stability is made to

*The Annual Oration, delivered before the Middlesex South District Medical Society, April, 1928.

†For record and address of author see "This Week's Issue," page 642.

prevail (Cannon, McIver and Bliss, 1924).

One more analogous instance we find in the stability of the body temperature. Let the temperature rise, and by vasodilation the warm blood is exposed to the body surface for heat loss; if that proves inefficient sweating occurs and cools the body by evaporation. Let the temperature fall and the heat loss is checked by vasoconstriction; also heat production is increased by secretion from the adrenal medulla, which accelerates combustion in the body and, in case that is inadequate, by shivering as well. Again note that mechanisms are in readiness to hold the organism steady, to keep it from oscillating widely from a median position (Cannon, Britton, Querido and Bright, 1927). In consequence the thermometer makers can place a mark on their instruments which is within a degree or two of our normal temperature at all times.

What are the general mechanisms by which these steady states of the body are maintained? The answer to that question will bring out not only the broad features of the stabilizing agencies, but will also disclose further instances of regulation.

An analysis of the mechanisms of stability reveals that there are two major modes:—the laying by or the use of supplies, and the speeding or the retarding of processes. Let me illustrate. Already we have seen that when the blood sugar is abundant it is stored in the liver, and when it is deficient it is withdrawn from that storage. Although we do not yet understand the way in which the affairs are managed there is good evidence that protein and fat are stored and released in a manner analogous to carbohydrate food. Protein is laid by in the liver and released in starvation. Also in starvation protein is taken from the less important structures and delivered to the more important structures so that they—the heart and central nervous system, for example—are spared. Fat storage in adipose tissue signifies abundance, and from that storage it is called forth in time of need.

The calcium of the blood is managed in a similar way. It is stored in the minute spicules and trabeculae of the long bones as Aub (1927) and his collaborators have so beautifully proved. It appears that the parathyroid gland system, and possibly the thyroid also, are involved in the control of the calcium percentage of the blood, and that usually it is kept at about 10 mg. per cent. When we consider that a drop to half that percentage leads to convulsions and a rise to twice that percentage may induce dangerous alterations of the blood we can realize the great importance of this regulatory arrangement.

There are stores of salts and water in the body as well, though these substances are probably not segregated as sugar is segregated in the liver. If they are taken in too great amounts at any time they pass the restraint present in the kidneys and escape in the urine. If the body is in need of salts and water they are withdrawn from the accumulation in the tissues. For long periods after total deprivation, the blood may remain unchanged in its salt and water content because of the perfection of these adaptive adjustments.

Back of the need for water is the automatic stimulus of thirst, the nature of which has already been described. Back of the need for food is the automatic stimulus of hunger. This disagreeable pang or ache arises from painful contractions of the empty stomach (Cannon and Washburn, 1912). When food is eaten the intense contractions are replaced by the mild peristaltic waves of ordinary digestion, which yield no sensations whatever. Again, note that by automatic arrangements the body needs are provided for.

The other mode, besides storage, of keeping the organism in a steady state is that of modifying the rate at which continuous processes are going on. Three examples will illustrate this procedure. First let us consider the provision of oxygen and the removal of carbon dioxide. Even the minimal activities of the living being require that these conditions for oxidation shall be met. When the body changes from rest to great activity, however, the need for oxygen and for removal of waste is enormously increased. Under these circumstances what are the internal adjustments? At the very start of activity, as a part of the innervation of muscles, the heart and the respiratory apparatus are set going at a faster pace. The contracting muscles pump the venous blood back from the limbs in larger volume, the deeper movements of the diaphragm favor the filling of the heart, the higher pressure of the venous blood in the right auricle causes the heart to beat faster as the larger volume of blood comes to it to be discharged, the larger output from the heart raises the arterial pressure and thereby greatly accelerates the rate of blood flow, and in the laboring muscles multitudes of capillaries, which have been closed, unfold until there may be more than ten times as many carrying blood as were there during rest. In addition to all these remarkable provisions for bringing the necessary oxygen to the tissues the spleen contracts and puts forth into the circulation a mass of concentrated blood, so that the oxygen-carriers, the red corpuscles, are increased by 20 per cent. or more. Furthermore, the increased carbon dioxide which develops in the muscles as a consequence of doing work not only causes the corpuscles to unload their oxygen more rapidly and more completely than before, but hastens the loading up with the carbon dioxide itself for transportation to the lungs. And in the lungs the deeper respiration keeps the oxygen percentage so high that it in turn hastens the unloading of the carbon dioxide and the loading up with oxygen. Among all the bodily adjustments to need there is no more beautiful example than this.

Another instance of the modification of a continuous process I have already touched upon in

referring to the regulation of temperature. We are constantly producing heat and losing it to the outer world. When the body temperature tends to fall loss of heat is lessened, and if that does not suffice to prevent a fall, more heat is automatically produced. On the contrary, when the body temperature tends to rise, all the means of increasing heat loss are utilized, and the processes of heat production are reduced to a minimum.

One other example of varying a continuous process may be cited. The activities of the body are associated with the development of acid substances. It is of the utmost importance that the reaction of the blood shall not be shifted to any considerable degree towards the acid side of neutrality—life would be jeopardized if that should occur. Ordinarily the acids are burned to carbonic acid. If the carbonic acid increases, respiration is increased, carbon dioxide is breathed away and thus the excess acid is eliminated. If non-respirable acid is developed, however, it unites with the sodium of the buffer salt in the blood, sodium bicarbonate, which neutralizes the acid, and the excess carbonic acid which results from the reaction is again voided by extra respiration. And if this process does not suffice ammonia is employed by the organism to neutralize the acid, and the kidneys then get rid of the combination. Should the blood become alkaline, again serious dangers would arise. Under such circumstances respiration is checked until carbonic acid is developed by the burning processes of the body and also alkaline salts are passed out in the urine.

In surveying these mechanisms for maintaining steady states we have repeatedly seen that whenever agencies act in such a way as to tip the organism in one direction or the other internal adjustments have promptly been called into service which have prevented the disturbance from going too far and have tipped the organism back to its normal position. Note that these are not processes which we manage ourselves. They are automatic adjustments. Like the governor on an engine, or the safety valve on a boiler, or the feed pipes which supply water, they are fixed to perform their appropriate function without careful watching whenever the need arises. In other words, our bodies are built to take very effective care of themselves, in many ways which we have become aware of only in recent years.

Analogous to these protective arrangements of the organism against risky shifts of internal equilibria are the material defenses of the body against external dangers. Many of the simple reflexes belong to this group of reactions. Let a foreign body enter the glottis and it is driven forth by a cough, let an irritant substance affect the conjuctiva and a flow of tears dilutes it and washes it away, let an inflammatory material go as far as the stomach and it is expelled by vomiting. An extraordinary fact observed when the duodenum is severed and sewed together again is that the pylorus holds tight against the recurring waves of peristalsis and only after about five hours does it relax and permit the gastric contents to enter the injured gut (Cannon and Murphy, 1906). The interest here lies in the relation of the delay to the process of healing; according to Abbe about four hours are required after an intestinal suture for a plastic exudate to form and make a tight joint. It is after time for that process to come to completion has elapsed, therefore, that the chyme is allowed to advance. Similar results were obtained when the section and suture were made further along the alimentary canal. The very process of repair of internal organs is remarkable. Unlike the surface structures the viscera have not been exposed to repeated trauma in the course of racial history; indeed, such damage as would injure the intestines, for example, would be likely to result in death. It is hard to understand, therefore, how the viscera could be "trained," so to speak, in reparative procedures or how there could be a basis of selection of such organisms as developed these beneficent reactions. And yet wherever the surgeon enters, whether the lungs, the liver or the brain, the disturbed tissues promptly become the seat of activities which result in healing and fresh organization.

In this company it is not necessary to lay stress on those responses of the organism which protect against bacterial invasion. The spectacular rise of the science of bacteriology and the flood of light which that science has thrown on our knowledge of infectious disease and its treatment have brought to all of us an acquaintance with the basal facts. The walling off of pyogenic germs, the phagocytic powers of leucocytes, the development of antitoxins to neutralize the bacterial toxins—what marvelous abilities are these which our bodies exhibit when they are placed in jeopardy.

In the long history of the race bacteria have not been the only foes, and perhaps, in wild life, they have not been the most important. There have been savage creatures, human and subhuman, watching with stealth and ready to attack without a moment's warning. In that harsh school fear has served as a preparation for action. Accompanying that emotion is an elaborate group of bodily adjustments. The heart beats more rapidly, the blood is driven from the splanchnic area to the muscles and brain and therewith the digestive processes are stopped, the respiration deepens, the bronchioles dilate, sugar is liberated from the liver, adrenin is discharged into the circulation, sweating is started, coagulation occurs more rapidly. All these changes can best be interpreted as preparations for physical struggle. The speeding up of circulatory and respiratory functions would anticipate the need for oxygen and for riddance of waste as muscles labor, the liberated sugar would serve as a source of muscular energy, the discharged adrenin would abolish certain effects of

muscular fatigue, sweating would carry away the superfluous heat resulting from work, and the faster clotting of blood would lessen the chances of serious loss if struggle should result in ruptured vessels (see Cannon, 1915). Clearly, if great and prolonged struggle is required, the organism in which these preparations have been most thoroughly made is most likely to be effective and to prevail.

In reviewing these examples of reactions of the body to harmful agencies in the outer world we note again that most of the reactions are managed automatically. Vomiting, coughing, lachrymation, the healing of wounds, the defenses against bacteria, the preparations for supreme effort in physical struggle—all these intricate and marvelous responses to disturbance by external agencies follow in a natural and ingrained order, without preliminary instruction or discipline, as an exhibit of the inborn "wisdom of the body." The mere fact that such native devices for self-protection exist is an encouraging and cheering thought—a basis for confidence and assurance, whether one is the patient or the physician.

Other observations of great significance in disclosing how bodily welfare may be maintained in spite of adverse conditions are those concerned with the factors of safety in the animal organism. To Meltzer (1907) we owe the special emphasis on this group of facts. He pointed out that when an engineer estimates the weights and pressures to which a boiler, a bridge or a beam is likely to be subjected he does not merely provide for such stresses in building the structure; he multiplies his estimates by three, six, or even by twenty, in order to have the structure thoroughly reliable. How are our bodies built? Are they set up with niggardly economy? Is barely enough provision made for keeping us intact? Or is there allowance for contingencies—have safety factors been introduced on which we may count in times of stress? There is abundant evidence that the latter condition prevails. We have two kidneys; as is well known, one of them can be removed and if the other kidney is normal the amount and the composition of the urine remain practically unaltered—a result explained by the fact that normally many of the glomeruli are inactive. Or consider the lungs, organs which, like the kidneys, are of primary importance to the organism. Again it is common knowledge that one lung may be largely consolidated by pneumonia, or it may be compressed by fluid or by pneumothorax, or it may be removed by surgical operation, without serious impairment of respiration. Similarly we may remove one thyroid lobe, half the parathyroid tissue, one of the adrenals, an ovary, a testis, or sever one vagus nerve or one set of splanchnic nerves and the remaining member of the pair will carry on the service quite satisfactorily. In all these cases the factor of safety is at least two.

Even more striking are the instances of safety arrangements in the unpaired organ. Removal of the entire pancreas results at once in extreme diabetes; but four-fifths of the organ can be extirpated without ill effects—only one-fifth is needed to protect against glycosuria. Three-fourths of the liver can be taken out, and despite the variety and importance of the functions performed by that organ, the loss does not induce symptoms which indicate any significant disturbance. Again, in the alimentary canal there is evidence that the body is not constructed on a pinched and skimpy plan. Much or all of the stomach may be excised, three-fourths of the small intestine may be resected, and a large part of the colon may be cleared away without endangering life. It is evident that there is much more of the alimentary canal than is needed for carrying on its functions. In the circulatory system the story is similar. There is much more blood than is needed for mere maintenance of an adequate oxygen supply. Nearly half the blood can be withdrawn and yet the organism will survive. Also the head of arterial pressure can be reduced about one third before a deficiency of the circulation becomes manifest (Cannon and Cattell, 1922). There is an arrangement for abundant supply of blood, therefore, to all regions of the body, even though some one region becomes active and has an extra need. In the nervous system the possibilities of reduction without impairment are more limited than elsewhere. Removal of one cerebral hemisphere in human beings has recently been reported, however, without marked disturbance of the mental state of the patient. There was, to be sure, paralysis of the opposite side of the body. In the nervous system the factor of safety is provided not in superabundance of structure as in other parts of the body, but in protection against injury. Surrounded by a hard bony case, the brain and spinal cord are especially guarded, so that the only collection of nerve cells which we shall ever possess shall not be injured.

Many more instances might be cited to show that our tissues and organs are abundantly provided with factors of safety. As Meltzer wrote:

> "The active tissues of most of the organs exceed greatly what is needed for the normal function of these organs. In some organs the surplus amounts to five, ten or even fifteen times the quantity representing the actual requirement. In the organs of reproduction the superabundance and waste of tissue for the sake of assuring the success of the function is marvelous. Furthermore the potential energies with which some organs, like the heart, diaphragm, etc., are endowed are very abundant and exceed by far the needs for the activities of normal life. The mechanisms of many functions are doubled and trebled to insure the prompt working of the function. In many cases the function of one organ is assured by the ready assistance afforded by other organs. The continuance of the factors of safety is again protected by the mechanisms of self repair peculiar to the living organism. We may, then, safely state that the structural provisions of the living organism are not built on the principle of economy. On the contrary, the superabundance of tissues and mechanisms indicates clearly that safety is the goal of the animal organism."

We have now reviewed three types of devices employed in our bodies to assure their well-being. First, there was the group of automatic self-stabilizing mechanisms which work to maintain constancy of internal conditions. As the Belgian physiologist, Frédericq, remarked many years ago, "The living being is an agency of such sort that each disturbing influence induces by itself the calling forth of compensatory activity to neutralize or repair the disturbance." Second, there was the group of reactions to external attack; these likewise operate to preserve the integrity of the organism. The French physiologist, Richet, has eloquently described this mode of response,—"The living being is stable. It must be in order not to be destroyed, dissolved, or disintegrated by the colossal forces, often adverse, which surround it. By apparent contradiction it maintains its stability only if it is excitable and capable of modifying itself according to external stimuli and adjusting its response to the stimulation. . . . The living being is subjected to all manner of impressions, but resists them all; it is continually renewing itself and is always the same." Finally there was the evidence that the body as a machine is constructed with generous margin for wear and tear and damage. Structures and functions have not been calculated on the basis of a close and frugal economy, but, we may say, with consideration that there will be stresses, perhaps prodigious stresses, which must be met, and that the organism should be ready to meet them.

The fathers of medicine spoke of the healing force of nature, the *vis medicatrix naturae*. All that I have done in reviewing the various stabilizing and protective devices of the body is to present a modern interpretation of this force. As we have seen, there are numerous ways in which through many years the normal state is maintained by automatic and native provisions and adjustments. If then the body can largely care for itself what is the function of the physician?

In the first place, he should be well acquainted with the possibilities of self-regulation and self-repair in the body. He needs that knowledge not only for his own intelligent action, but also as a source of encouragement for the patient who looks to him for counsel. Then, he should realize that many of these remarkable capacities for adjustment require *time*—all the processes of repair belong to this category—and they can play an important rôle in restoring the organism to efficiency if only they are given the chance which time provides. The physician, therefore, should wisely assure the conditions which permit the damaged body to continue active until lost or injured parts have been rebuilt, strengthened, or compensated for. Again he should recognize the limitations of the capacities of adjustment. For example, external heat, plus that produced by the working parts, may be so great as to run the body temperature up to a dangerous height. The adjusting mechanism, in other words, may be overwhelmed unless external aid is given—such aid as the alert physician can render. As another example, consider emotional excitement. Fear and anger, with the attendant internal preparations for struggle, may be serviceable in wild life, or when physical effort is imminent, but in the circumstances of civilized life these emotions may be baneful disturbers of vitally important processes. These are facts which the informed physician should understand and explain, so that they may be useful. Furthermore the physician should realize that many of the therapeutic agencies at his command actually represent the self-righting or self-protective processes which we have been considering. When he gives insulin for diabetes, his treatment is serving in a natural manner to perform a natural function. When he gives thyroxin for myxoedema or cretinism, he is using a physiological agent for a physiological defect. And when he gives antitoxin he is helping the defensive reactions which are regularly a part of the body's self-protection. Thus the physician plays his rôle in making effective the self-regulating adjustments of the organism that have been disarranged or that are in need of reinforcement. It is an encouraging fact that a mode of treatment used on a sick person to restore the normal state is commonly more potent than when it is used on a well person. Thus cold applications will reduce a high fever, whereas the same applications will not lower a normal temperature. A dose of thyroxin which will markedly raise a metabolism which is low because of thyroid deficiency will have little or no effect in raising the normal metabolism; and a given dose of insulin has a much greater effect in a severe case of diabetes than it has on a mild case. Thus nature herself appears to work with the curative agencies which the doctor applies. Finally, there is the great service which the physician renders to his patients in bringing hope and good cheer. That alone justifies his presence. In the facts which I have tried to bring before you I trust that I may have given a reasonable basis for extending hope and cheer to the sick, a basis laid in the numberless evidences that in the body there are admirable devices for maintaining stability against disturbing conditions, marvelous provision for protecting the integrity of the organism against external foes, and a very liberal margin of structure and function beyond the ordinary requirements. When hardship comes and bodily resources seem low let us think of these powers of protection and healing which are working for bodily welfare.

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THROMBO ANGIITIS OBLITERANS*

(Buerger's Disease)

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THE importance of a disease whose toll is disability, pain and possibly mutilating surgery, not to mention social and economic dependence, is one that merits discussion. My first acquaintance with it was made fully twenty years ago. Because it had, as one of its results, gangrenous lesions of the extremities, it came to be classed along with senile gangrene, and radical operative surgery was advocated by most general surgeons into whose hands these patients fell. This was the case with the first of them that came to me. The patient was a Jew, the owner of a large department store in a nearby city; when I saw him he had been suffering torture because of a local gangrene of one of his toes. There was absence of pulsation in the dorsalis pedis artery of that foot. At that time, having been surgically trained to believe that such a situation could eventuate, sooner or later, in nothing but an amputation, I cut off his leg at the point of election, and he made a good recovery. Something over a year later he came to me again with the same condition in the remaining foot, but neither he nor I was quite so keen for amputation as in the previous year. The result was we "sat tight" and he was made as comfortable as possible and went on to a complete recovery. I have seen him at various times since, the last occasion being three or four years ago, when he had just sustained an intracapsular fracture of his thigh but had had no recurrence of circulatory disturbance in the unoperated, nor any extension in the operated, leg. At about the same time the late Dr. Robert Lovett had an identical experience. Dr. Meyer‡ of New York, who has long had a keen interest in these conditions and has written extensively about them, acquired his interest in them as a result of the same sort of experiences. These two cases forcibly impressed me with the idea that here was a type of gangrene that needed to be dealt with in a manner quite different from that which was being accorded to gangrene caused by the various dyscrasias, or senile atheroma. Buerger had only just then (1908) published his first studies upon the subject but even since then, in this vicinity at any rate, general surgical opinion has not been materially different than it was at the time of which I speak.

This condition is one which is peculiar in many ways. In the first place, it is confined almost invariably to the male sex. I have come across only four or five recorded cases in women. Secondly, it is a disease of young adult life (20-40 years). Thirdly, it is far more common among Jewish people than in any other nationality, statistics seeming to reveal the largest number among the Russian, Polish and Rumanian Jews, i. e., occupants of Central Europe. From Continental Asia, Japan, South Africa, Sweden, Norway and Great Britain cases have been reported among their own Nationals. I, myself, can recall at least two in Gentiles. Fourthly, the lesions occur in the lower extremities almost exclusively. A few have been reported in the upper. I recall only two in my own practice and one of these was a newsboy of twenty-nine who had lost both legs by amputation and was facing the same threat in his hands. I have but recently seen a Jewish woman with what I believe to be the same condition in her fingers. A few instances of the same lesions which were located in the coronaries and the aorta have gotten into the literature. It is called in Germany the "Jewish Tobacco Disease" because Erb[1], who wrote extensively about it in the early '90s, was convinced that the cigarette smoking of the Jewish youth, which is commenced in early life and continued, was a prime factor in the causation of the trouble. He also thought that the drinking of strong tea, so common among Russians, had a similar effect to the alkaloid of tobacco.

Buerger[2], as a result of an extensive opportunity to study these cases at the Mount Sinai Hospital in New York, has become convinced that there must be an infectious factor entering into the etiology, largely because of the proliferation of the intima of the vessels and the periarterial infiltration of tissues. Rabinowitz[3] has satisfied himself that he has discovered an organism which he regards as a specific for the disease, but so far few supporters have been found for this conception. Neurological opinion seems to lean more to the theory that it is a racial inheritance of a certain neuro-arterial or venous dyscrasia which, under certain conditions, paves the way for a thrombotic occlusion of peripheral vessels[4]. Studies in the laboratories upon these cases have yielded very few results. Some have found an excess of red cells in the blood; others, in the early stages, have discovered a leucocytosis. Wassermann tests have been pretty generally negative. When it comes to the chemistry of the blood, certain observers have noted changes in the amount of blood sugar (Glycocythemia, Willy Meyer) and others have found the coagulation time to be low (two to three minutes), which has led to the theory that changes in viscosity were important factors, and upon this theory has been

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†For record and address of author see "This Week's Issue," page 642.

‡Meyer (90), Ann. of Surg., March, 1916.

based much of modern treatment. Whether the trouble lies in the blood stream, the vessel walls, the vaso-motor system or in certain infections, or a combination of one or more or all, plus the outside factors of racial inheritance, habits and constitutional and temperamental tendencies, will have to wait for a final determination until more data are available. The fact that such a large proportion of the Jews who furnish by far the more numerous groups of these patients come from Central Europe, where typhus is constantly epidemic and where so few escape having it, has led to the suggestion that this disease may have something to do with the etiology of thrombo angiitis obliterans. Women, however, are not exempt from typhus but provide very few instances of this disease.

Clinically, cases of this class present a fairly clear picture. They often complain of a stage of "intermittent limping" prior to the development of the characteristic gross changes of the full-blown case. In this first stage they may be able to walk only a block, perhaps not so far, before pain will come on in the calf of the leg and reach such an excruciating degree that walking must be stopped, when the pain immediately ceases, only to be resumed on a similar amount of walking. This may last for months before anything else develops. Indeed this stage may only declare itself when the patient hurries out of his normal gait. Then follows a period when the patient observes changes in the color of the limbs when they are allowed to hang down, as in the sitting position, or are elevated to a higher plane than normal. When this is noted, or even a little before, pain becomes more or less constant, being particularly aggravating at night. The color of the dependent foot changes from a dusky, purplish-red to a bright red, streaking up from the toes to the dorsum of the tarsus. Associated with this stage one often meets with ulcerations on the toes, more frequently the first or the fifth, for the centrally placed toes get their blood supply from two sources. Then ulcerations are very frequently associated with fissures about a nail, ingrowing nails and minor surgical procedures[5] directed to the treatment of such conditions. Oftentimes it is the reluctance of these to heal that really directs attention to the condition behind it all. A certain number of these go on to gangrene, limited to the toe first involved, in many instances. Such patients show an absence of pulsation in the dorsalis pedis artery and it may be in the posterior tibial also. The fact that these symptoms are manifesting themselves in young, vigorous men, as a rule, points away from the commoner causes for gangrene[6]. Silbert states that the statistics of Mt. Sinai Hospital in New York, for the past fifteen years, indicate that a majority of admissions with thrombo angiitis obliterans suffered an amputation of one limb within five years of the onset of the symptoms. Perla, quoted by Gammill[7], states that the life of a limb, after the onset of symptoms, averages two years but may continue with remissions, which are the rule, for twenty years.

My own experiences, and that of others, indicate that the thrombosed condition of the vessels may exist for years without becoming bad enough to cause pain, ulceration or gangrene, only making itself known through the symptoms of "intermittent claudication" when the individual ran or hurried his usual walking gait.

HISTORY OF THE DISEASE

It has been a good many years since this condition found its way into the literature. Czerna[8] refers to cases reported by Savory in 1856 having signs and symptoms of the same sort as Buerger describes, but it was left to Billroth in 1869 to amputate the leg of a patient with gangrene from this cause and turn the specimen over to Winiwarter, who gave the first precise pathological report on this type of circulatory disturbance in 1879, calling it "endarteritis obliterans". He (Czerna) gives a detailed account of a case of thrombo angiitis obliterans that came to autopsy. From the studies he made on this material he apparently got no support for Buerger's theory of the toxic cause of the lesions. Joblons[9] also in 1856 claims priority of description for Charcot who called attention to Bouley's description of the same thing in animals, some years before. In 1889 Sachs and Wiener described a case in which a toe was amputated. They thought it was erythromelalgia, the condition Weir Mitchell had recently described in the *American Journal of Medical Sciences* for March, 1876. Parkes-Weber[10] recorded a case in 1907 which he classed as "angiokeratoma with bony changes". A number of years later a colleague showed the same case under the diagnosis of thrombo angiitis obliterans. Buerger[11] in his original contribution gives an outline of the historical background, in which he describes the two schools of thought which originally dealt with the matter: the one following Winiwarter, which regarded the vessel occlusion as due to proliferative changes in the intima, and those who, following Von Monteuffel, regarded it as a peculiar type of arterio-sclerosis in which desquamation of the endothelium in the popliteal artery gave rise to white clot. Sinkoe[11a] cites Burrow in 1867 and Jasche in 1865 as having described these lesions, but left the accurate pathological description of them to Friedlander in 1876. Wedinsky also described them as occurring among the Russians.

Before taking up the etiology, it may be well to enumerate various and numerous names which have been given to this condition, of which the following are the more common: Dysbasia, angiosclerotica, erythromelalgia, vasomotor neurosis, angina cruris, intermittent claudication, Gangstöcking, juvenile gangrene, presenile gangrene, spontaneous gangrene, oblit-

erating endarteritis, local asphyxia, acrocyanosis, acroasphyxia, acrosphacelus, paralysic vasomotrice, pseudo erythromelalgia, non-syphilitic endarteritis obliterans, Raynaud's disease, Yiddische Krankheit, Friedlander's disease or progressive sclerosis (Osler) of the arteries, and finally, Buerger's disease.

ETIOLOGY

There have been a number of explanations of the cause of these clinical phenomena, none of which are wholly satisfying. Up to the time that I became aware of the fact that the literature was full of reports of cases occurring outside the Jewish race [Weber[10], Buerger[11]] I was pretty well satisfied with an explanation that took into account the neurotic character of the nationality, the peripheral location of the lesions and the irritative nature of the alkaloid, nicotine. It may be that the wider distribution of Nationals who have the disease does not negative the essential reasonableness of that hypothesis. It has been pointed out that perhaps one of the chief reasons for the belief that this is a racial disease was the fact that at first all the cases were reported from Jewish Hospitals. Meleny and Miller[12] show that in China, reports from fifty-three clinics, indicate that thrombo angiitis obliterans is recognized as such, and treated as such. Furthermore the cases reported from these clinics invariably occur among their own Nationals. This is true of reports from Japan, Norway, South Africa and for numerous instances reported from Great Britain, though in London most of the patients were of the Hebrew race. In view of these facts it would seem that a revision of the significance of race as an etiologic factor will prove to be necessary. The influence of sex, an influence suggested by the very few instances reported among women, links up fairly well with the theories of those who espouse the neurotrophic and nicotine theory, for smoking among Jewish women is rare indeed and they, as compared with the men of the race, are more stolid and phlegmatic. Buerger's first five hundred cases included only three women. Savory's case in 1856, referred to by Czerna[8], was a woman, and there have been a scattering few besides.

Silbert[13], who feels that etiology is very much in doubt, favors an hereditarily transmitted defect. He is in doubt as to whether the fault is in the blood, the vessel walls, the sympathetic nervous system or the endocrine glands. Stühlern[14], citing Charcot, Erb and Oppenheim, believes there is a "congenital disposition" and that it is a "neuro vascular disease". Labbè and Heitz[15] assign to tobacco an important contributory rôle. Syphilis is, by them, excluded from the etiology. They discount any climatic influences prevalent in Central Europe because the descendants of those who had not had the disease but who have emigrated to America, have it. Poverty and malnutrition come in for consideration as these factors may influence the viscosity of the blood. They quote Shattuck, Strong and others, working during the World War in Roumania, to the effect that many typhus subjects were affected with a peripheral gangrene, and they also point out the great prevalence of typhus in that part of Europe. Joblons[16] cites Idelsohn's report of 226 cases found in localities all the way from the Baltic to the Black Sea as proof that there is no geographic or climatic factor of importance in the etiology. Syphilis, diet, typhus and heredity he considers of no moment. Tobacco and occupations involving strain upon the circulation and thermal exposure he favors as etiologic factors. The claims of Barber, Rabinowitz, Buerger and Bernstein in support of an infectious origin he considers unsubstantiated. Main[17], quoting Mayesema's report of increased viscosity of the blood, bases his treatment on this observation. Meyer[18] opposes the idea of infection and emphasizes the claims of his own theory, viz.: that tobacco is the essential factor coupled with the nervous instability of the Jewish occupants of Central Europe, always in mortal dread of pogroms and other forms of persecution. Through these nervous instabilities he thinks the endocrine chain becomes disturbed and its functions perverted.

Orr[19] had made from the extracted teeth of one of his patients with thrombo angiitis obliterans cultures which killed rabbits in twenty-four to forty hours. No lesions could be produced in the blood vessels of these rabbits though there were vegetations on the heart valves. Attempts to obtain cultures from the vessels and thrombi contained in them, after amputation, were negative. Sigler[20] is led to think that smoking is an important factor in etiology; he does not believe in an exclusive, racial factor but does think that frost bite and trauma in early life may have their effects on blood vessels. He believes that many factors enter in to pave the way for an infection. Weber[21] cites an extremely interesting case in support of his feeling that the neurotic factor is a conspicuous one in the etiology. Several members of his patient's family had manifested evidences of various neurotic disturbances. He had followed the case for eighteen years. Joblons[22] discusses the many claims in support of the "angiospasm" theory of Erb and other German clinicians, notably Schlesinger, Oppenheim and Cassirer and of Weir Mitchell's vasomotor neurosis, erythromelalgia. The work of Bernheim, studying agglutination tests in an endeavor to find support for an infectious theory, was discussed and discarded on the strength of the failure of Schultz, Leina and Wohlbach to corroborate. The typhus theory went by the board along with these observations also. Teeth and tonsils as sources for infections were dismissed. Rabinowitz[23] claims to have isolated a bacillus and to have been able to activate lesions existing in a patient by giving

a transfusion of another's blood. The same lesions were reproduced in rabbits when this organism was inoculated in the human subject from which the bacillus was obtained. Five weeks after inoculation of the rabbits, gangrenous lesions appeared on the soles of the rabbits' feet. Sinkoe[24] refers to the great number of tailors among the Jews, but offers no statistical proof of the possible occupational influence of the tailor's favorite position when at work, upon the causation of thrombo angiitis obliterans. Minor surgical traumatisms, he points out, are a frequent starting point for serious symptoms in these patients. Gottlieb[25] emphasizes this latter point also. Meyer[26] feels there is something wrong with carbohydrate metabolism in these patients and that this is a causative factor. He treats them, because of this belief, as if they were diabetics. Of course it is generally recognized that diabetics are prone to chronic perforating ulcers of the feet, but in other respects the physical signs in the feet are not like thrombo angiitis obliterans. Goodman and Bernstein[27] report on eighteen patients upon whom they studied agglutination reactions in their effort to show that typhus might be concerned in the etiology. Knight[28] feels that etiology is far from being settled and among the various factors he mentions was an experience of Ochsner's, who found in cases of this kind among his Swedish patients some who ate a great deal of salt meat and were much improved under a salt-free diet. Meyer[29], from his own studies and those of Bernheim upon blood chemistry in these patients, considers that the whole etiologic basis of this disease has been shifted from an affection of the blood vessels to a constitutional disturbance, for which he proposed the name "glycophilia." Gottlieb[30], basing his opinion upon further opportunities to study these cases, feels that any restrictions upon the circulation of the foot through tight shoes and the tendency of these to produce corns are important contributory factors in bringing about thrombo angiitis obliterans. Buerger[31] claims that definite purulent foci exist in these cases, from which certain specific toxic agents are derived, and that on such an hypothesis alone can one account for the perivascular infiltration and the thickening of the intima.

In these thirty-one references to the literature, dating back to 1904, we find practically every suggestion that has been made as regards etiology. Some are less vulnerable to criticism than others, but none are entirely satisfying. It seems to me that conception of the matter which takes cognizance of the element of nervous instability as a fundamental factor, about which the secondary factors gather, gets us into less difficulty and satisfies more of the requirements than any other. So far as the racial preponderance among the Jews is concerned, it is certainly true and is not unreasonable to suppose, now that it is becoming known that the condition is not exclusively a racial affair, as had been supposed, that there are individuals of other nationalities than Hebrews who have the same kind of nervous instability, though not perhaps so universally. So far as the use of tobacco is concerned, there are, of course, many non-Semitic individuals who smoke cigarettes to excess, but racially it is far less the rule for them to begin the use of tobacco at so early a period in their lives (10-12 years) and continue it so steadily through youth and manhood. It is possible also that the quality of tobacco is better in the brands the non-Semitic smokes. The freedom from this affection among women offers no obstacle to the acceptance of the idea of an irritable nervous system on the one hand and certainly supports the nicotine theory on the other, for Jewish women are not addicted to tobacco and are far less sensitive, nervously, than the men of the race. The higher up in the social scale one goes among the Jews, it has been my observation, the less thrombo angiitis one meets.

The localizations of the lesions in peripheral vessels so generally must have, I believe, some significance. The few scattering references to the same lesions found in the coronary arteries do not indicate a factor of any etiologic significance, whereas the great preponderance of them in the peripheral vessels of the feet and legs with moderate frequency in similar vessels of the upper extremity suggests certainly that localities where the rate of flow may be supposed to be slightly slowed down might readily supply a factor of some importance in determining the localization of lesions, if not, indeed, of their very incidence.

The tying-up of tissues about the arteries in which thrombi occur does not necessarily speak in favor of an infection, for every one is familiar with similar conditions in other diseases where no infection is even suspected. If there had been any unanimity of opinion in respect to the identification of organisms either in the local lesions or distantly located, but apparently causally related to the advent of thrombo angiitic symptoms, one might regard Buerger's toxic theory with more favor. As the literature stands today, it seems to me the three significant etiologic factors are, first, a highly sensitized nervous system in consequence of which the vaso motor nerves are peculiarly responsive to stimuli derived from the circulating blood. Secondly, toxic irritants, in the form of chemical alkaloids, such as nicotine etc., find opportunity, because of retardation of flow in peripheral vessels so located, and by in some way roughening the intima, to provide the matrix for the formation of a white thrombus. These thrombi may locate in the deep vessels of the leg or may be confined to the more superficial ones.

The fact that in certain cases glycemia may be found does not prove anything. Diabetes is of very common occurrence among the Jews and so far as the reported observations on this phe-

nomenon in thrombo-angiitis patients is concerned, it does not appear that it is an association of any greater frequence than one might expect among individuals of a nationality among whom both diseases are of more than usual frequency. The same thing might be said about diabetic gangrene. In the Jew diabetes is a common affection and among diabetics gangrene not infrequently occurs, but the occurrence of glycemia among thrombo angiitics is not more common than the association of gangrene with the true diabetic. Systematic Wassermann observations upon thrombo-angiitic patients have been made, but syphilis has not been detected among these patients any more frequently than in a similar number of cases studied in this way, if taken at random. Studies upon the blood have been unproductive of results so far as the corpuscular elements are concerned. Two or three cases of polycythemia have been recorded but obviously such a condition is only a coincidence and the same is true of the one or two patients who were found to have a leucocytosis.

What shall be said regarding the low coagulation point that several observers have called attention to and have based treatment upon, the results of which seem to indicate the correctness of their observations? Claridge[32] reports seven cases in which the coagulation time had been extended from 2½″ up to 8″ to 10″ and in five of them he concluded that amputations had been prevented. Two did come to amputation, one of which was before the starting of any treatments with citrate solution. Whether this condition will be found to prevail in these patients only after the condition has gone on for some time, and is therefore probably only a sequel of the long continuance of a distressing condition, or whether it may later be shown to sustain a causal relation to the condition, remains to be seen. Other studies[33] upon blood chemistry have been made showing no retention of nitrogenous material but 115 mgrms. of blood sugar per 100 cc. at the zero point and no sugar in the urine. It was upon these and other similar figures that Meyer's glycemia theory was based.

When we come to consider the evidence brought forward in proof of a toxic origin for this disease, we are again in a position which is hardly tenable. Vincent[34] has experimented with an antigangrenous serum, basing his faith in this upon his belief that there are many anaerobic bacilli which are easily brought into the human body and some of these are gangrene producing organisms. None of the cases in which he used his serum appear to have been of this nature. The theory that, because so many of these cases occur in emigrants coming from Central Europe [as suggested by Labbè and Heitz[35], and Goodman and Bernstein[36]], typhus fever may play a role in its causation is not very reasonable from a purely clinical viewpoint and certainly the experimental proof offered by Goodman is not conclusive.

Rabinowitz'[37] proof of the toxic character of the lesions of thrombo angiitis obliterans is far from conclusive and Buerger's[38] conversion to this belief is not based upon any bacteriologic or serologic evidence but upon that of infiltration of the intima and the adhesive fibrosis of the deep seated vessels. It would not appear that enough proof had been offered to sustain the contention that infection caused it or even paved the way for it, as has been suggested by Orr[39]. Blood cultures have been done in a few cases; four patients were studied by Meleny and Miller[40], following the technique of Rabinowitz, and all four were negative. So far no evidence of pathological change in the adrenals, pancreas or other endocrine glands has been found at autopsy in support of the hyper-glycemic theory. Buerger, quoted by Joblons[41], did two autopsies and found no changes in the endocrine glands. Meyer[42] made some rather interesting computations upon the quantity of nicotine inhaled as a cause of this disease; how accurate they were may be open to question.

PATHOLOGY

Outside the local changes in the peripheral vessels, very little has been discovered that appears at all pathognomonic for this disease. The essential changes are found in the intima of the arteries and veins of either the deep or superficial systems, or both, and in the white thrombi which occupy the vessels. These thrombi are not continuous throughout a given vessel but may be spaced by areas of apparently normal vessel. The intima is infiltrated with round cells and the adventitia is thickened and matted together with it are often found the accompanying nerves. There is a tendency for the clot to become canalized as the case progresses and a considerable proportion of the normal amount of blood conducted through these vessels may eventually be carried. The thrombi are usually adherent to the walls of the vessels during some part of the space occupied by the thrombus. There are often numerous so called "wandering phlebitis" lesions in the superficial layers of the skin where there will be seen short, bronzed or purplish lines which, to the touch, are thread-like phlebitic lesions in the larger capillaries. These are frequently quite remote from the seat of the essential changes. Blood pressure ranges a trifle low as a rule. The occasional variation in the red and white corpuscle count seems to be of no very striking moment. Skin changes and alterations in the nails which are cited by some observers are doubtless the natural dermatological changes seen where skin nutrition is interfered with. Observations made on the surface temperatures over the affected parts are significant when carefully conducted with a "thermo-couple". There is very great development of collateral circulation in all cases of thrombo angiitis obliterans. Four or five times as much bismuth paste was required to inject the vessels of amputated limbs

in cases of thrombo angiitis obliterans as in cases of arterio-sclerotic gangrene. Lewis and Reichert[43], who made this observation, concluded that the progress of this disease was a race between the two processes, obliteration and collateral proliferation. No changes of significance have been observed in the peripheral nerves. The nutrient arteries of the nerves have been noted to be involved and to this fact has been credited the severity of the pain in certain of these patients. New formed vessels canalizing the thrombi have also been observed to become themselves occluded by a thrombus.

Christianson[44], reviewing the laboratory findings in this disease, points out that examination of the blood for nitrogenous constituents, e. g. cholesterol, chlorides and the combining power of blood, were normal; that stomach analyses were negative and basal metabolism normal. The affected vessels are shown to be much smaller than normal ones by Gleckler[45]. Strength of pulsation in affected arteries does not appear to be proportioned to the extent of the thrombotic condition. The sympathetic nerve fibers are occasionally caught in the periarterial fibrosis[46], which probably is a factor in cutting down the blood supply traversing such an artery. Buerger[47] concludes an article in the *Am. J. Med. Sci.* by saying that the lesions of thrombo angiitis obliterans show, first, an acute inflammatory, thrombotic occlusion; secondly, a stage of organization and healing with disappearance of miliary giant cells and organization and canalization of the clot with disappearance of inflammatory products; and thirdly, development of fibrotic material in the adventitia, binding together the arteries, veins and nerves. In the absence of any evidence to connect bacterial activities with the lesions above described by any of the modern bacteriological methods of investigation, it would seem reasonable to infer that such lesions were of some other origin and fortunately there is nothing in the character of the pathological changes described which is inconsistent with a non-bacterial cause.

CLINICAL COURSE, SIGNS AND SYMPTOMS

As has been intimated[48], the real beginning of the clinical course of this condition antedates by months, and probably in many cases by years, the indications which bring the patients to the doctor. Long before there are signs of passive congestion or pain, when the limbs are not being used, the pathological changes have started but give no indication of their existence until, and unless, the patient speeds up his accustomed rate of locomotion, when he may be conscious of an ache or even a slight pain in the calves of the legs, not enough at first to cause him to stop walking, but merely to render him conscious of a sensation, more or less disagreeable, which should not be caused by so slight an exertion. From this condition it goes on, by almost imperceptible gradations, to a state called "intermittent claudication", a state where "blood hunger" is so intense that one is obliged to pause until the circulatory needs become satisfied. Next comes the stage when elevation of the leg causes blanching of the skin and depression of the leg causes a purplish-red congestion of the toes and dorsum of the foot, of varying intensity. If examined at this time, absence of pulsation, or at least a decidedly perceptible diminution in the arterial pulsation of one or more of the larger arteries supplying the limbs, may be noted and the foot is cooler, both subjectively and objectively, than the normal one. When the thrombotic changes are in the part of the femoral artery above its division into anterior and posterior tibial, the pain is less severe because the artery, vein and nerves are not so intimately associated and therefore do not become so tied up in the infiltrating process in the adventitia as is the case below this division. Minor abrasions about the nails, ingrowing nails and trivial surgical procedures for their relief frequently start trouble by causing a wound in the soft parts which refuses to heal and from this state it is often not long before a gangrenous condition develops. At this time one may often discover the so called "wandering phlebitis." Blood pressure is low; Wassermann reactions are usually negative and a general physical examination is not likely to give any striking results. Pain is excruciating and unrelenting; these patients often pace the floor the greater part of the night and get no relief from posture, local applications, or any drugs, short of morphia. They are willing to accept anything to obtain comfort and it is generally the easiest thing in the world to persuade them to undergo amputation. It is this fact, coupled with the disinclination of the surgeon to pursue a conservative course, that results in so many grossly mutilating operations for their relief. Spontaneous remissions of symptoms are very common, in fact might be regarded as the rule. The pain which these patients suffer is due to arterial spasm, according to studies made by Lewis and Reichert[49], who found that when thrombi were formed high in the femoral, if the artery were tied distal to the origin of the profunda, pain ceased and collateral circulation went right on forming, but the disease process did not appear to be checked by such development. Beers[50] says that varying combinations of ischaemia, oedema, cyanosis and loss of arterial pulsation may be met and that the severity of symptoms does not always correspond to the degree of occlusion. Weber[51] emphasizes, by citation of the interesting family history of one of his cases, the importance of going thoroughly into the nervous system history of these patients. In cases where there is marked arterial obstruction, marked pallor of the limb occurs when the leg is raised to an angle of 180 degrees, whereas at this angle the normal foot keeps its color. The artery with obstructed circulation shows a reactionary hyperaemia at once when a

dependent position is assumed. Pachon[52] has devised an oscillometer with which to measure the degree of obstruction in an artery and thus get a line on the proper level at which to amputate, where amputation is unavoidable, (52a & 52b). Collins and MacRae[53] have practiced injecting the femoral vessels with diffusible salts which may be immediately subjected to X-ray study, thus enabling one to determine the extent and distribution of obliterating thrombi in the vessels supplied by the femoral and in the femoral itself. Experimental work carried out by Marcus in Sweden[54] showed that gangrenous conditions analogous to those occurring in Raynaud's disease, could be induced in animals by injecting adrenalin in large doses and if, when this was stopped, virulent cultures of streptococci were introduced into the veins, septic thrombi could be produced in the vessels. No connections between septic conditions in tonsils or teeth were demonstrable in any cases studied. This condition is often wrongly diagnosed, being treated for flat foot, neuritis, erythromelalgia (Weir Mitchell) senile gangrene (the endarteritis obliterans of Osler) and Raynaud's disease.

DIFFERENTIAL DIAGNOSIS

Judging from the experiences that patients relate to me when they present themselves with thrombo angiitis obliterans, I should judge that one of the commonest early diagnoses was "flat foot." It is difficult to see how such a diagnosis could be considered when any of the pathognomonic signs are present. It certainly could only be the history of pain on the use of the feet that could lead one to even suspect flat foot in a case of thrombo angiitis where any of the distinctive signs had appeared. Every one should know that an objective "flat foot" may be entirely symptomless. The characteristic feature of the early painful stage of thrombo angiitis is that the pain is a "claudication" phenomenon. If such appears to be its characteristic, then one will almost surely find feebly pulsating dorsales pedes or a complete absence of pulsation in them. It is in such early cases that the oscillometer or the thermo-couple will prove of service, though in a rough way the raising or lowering of the affected limb, watching the while for color changes in the skin as the leg is raised or lowered or testing the heat and cold sensations in the limb with the back of the hand will provide a fairly accurate gauge of the circulation. With any of these phenomena present or even with all of them apparently absent but with a perfect history of claudication, "flat foot" should be ruled out. Erythromelalgia is a vasomotor disturbance having pain and redness as the most conspicuous features, but the redness involves the soles of the feet far more than it does the toes and dorsum of the foot. It is much more likely to show remissions and the discoloration is a brighter red than the dusky, purplish red color of the foot in thrombo angiitis obliterans. Ulceration is rare and so is claudication. Indeed in my experience the condition itself is very rare. Scleroderma causes conditions in the extremities closely resembling thrombo angiitis and when, as is sometimes the case, it starts as a sclerodactyle, the confusion in diagnosis between it and Raynaud's disease or thrombo angiitis may be very considerable. Longcope[54a] has reported some interesting observations upon hypoglycaemia in scleroderma. In Raynaud's disease we have the greater tendency to symmetry of the lesions in the feet and hands and the alternate blanching of the skin, the so called "dead fingers", followed by passive congestion. There is no sign of "wandering phlebitis" as there so often is in thrombo angiitis.

In cases of arteriosclerotic gangrene, where the arterial system shows unmistakable indications of hypertension, diagnosis is not difficult, for the high blood pressure and palpably sclerotic vessels are not present in thrombo angiitis obliterans. In the pre-senile stages of this condition where the sclerotic changes are confined to the anterior and posterior tibial vessels chiefly, (a condition sometimes called angina cruris), there is claudication, and a cold foot, absence of dorsalis pedis pulsation, but rarely any discoloration and no pain except on walking for a certain distance. In these cases in individuals who are below the age when arteriosclerosis manifests itself as a general process, one is frequently able to demonstrate arterial changes in the dorsalis pedis and posterior tibial in the radiogram. The question of diabetes as a cause for ulcerations having certain of the characteristics of thrombo angiitis is rendered more confusing by the fact above referred to, viz, the occurrence of sclerodactyle as a disease to be differentiated and the further fact that hypoglycemia may complicate this lesion.

TREATMENT

It is inevitable that where there have been so many theories as to causation and so little attention paid to the pathology and clinical course there should be many and various treatments devised. Another reason for the adoption of treatment which ignores the natural reparative processes that characterize the disease is the willingness of the surgeon to lend his technical operative skill to relieve suffering without waiting for Nature to make her efforts effective. The patient, who can scarcely be expected to be in a position to weigh the evidence, is willing to accept *any* suggestion that offers prospect of relief, assuming, of course, that it is the best that can be suggested.

On the theory of the lessened coagulability of the blood, solutions of normal salt, Ringer's mixture, and citrate of sodium have been given to maintain a 7″ coagulation period. Claridge, Silbert, Main, Meyer, Stone, Kayans, Steel, McArthur, Ginsburg, Evans, Maes, Boving, all re-

port good results from the employment of this principle. In some cases, as with the citrate of sodium, in 5% solution and in 250-300 cc. doses, injection should be made daily directly into the veins, or with Ringer's solution through the duodenal tube in massive dosage (1000-1200 cc. or more). On the theory that there has been some infection, reference has already been made to the use of serums and vaccine after agglutination tests, but in all such cases there is very little evidence in support of this hypothesis. Goodman and Gottesman[55], arguing from the beneficial results reported from the treatment of chronic arthritis by foreign proteins, gave typhoid vaccine in four cases with favorable results. It is difficult to see how they could find justification for their belief in a curative effect, though it did appear to relieve pain in one or two cases, but it did not prevent amputations in others of their patients.

The more recent studies, by Meyerding[55a] at the Mayo Clinic and by Brown[55b], upon the use of typhoid vaccine, would seem to offer promise of relief for pain in these cases and observations now being made along this line by Dr. Arthur W. Allen and co-workers at the Massachusetts General Hospital, but not yet published, are encouraging because they supply a means of escaping from the severe pain during the time that the process of readjustment of the circulation is being carried out. It must be understood that when this has been accomplished, it is probably true that the individual may have to live on a somewhat lower plane of physical activity, for the new network of vessels, though they may accommodate a sufficient quantity of blood, is not so well planned as to distribution nor so flexible in respect to the vasomotor control under which they are regulated. I have recently seen a man of forty-five with typical lesions of this nature that were brought to a stage of pain, congestion and obliteration of the dorsalis pedis vessels by a direct injury to the leg when he was struck and knocked down by an automobile. His history revealed the fact that for many years previous he had had definite claudication symptoms whenever he hurried out of his accustomed gait. He had thought nothing of this, however, and except for this had never had a symptom or sign of thrombo angiitis. During the time of my observation of him after this accident he had a pulmonary infarct, presumably a direct sequel to this lesion. Dr. Buerger, whom he subsequently consulted, wrote me that the patient is doing very well. His treatment consisted in remaining in bed for about two months with gradual restoration to functional activity aided by exercise and gentle massage during the latter part of the time.

Postural exercises have been advocated by Buerger and Claridge[56]. The latter suggests elevation of the leg for from one half to three minutes to an angle of from 60-90 degrees, then lowering it to the floor for two to five minutes, then allowing it to remain horizontal on the bed for from six to ten minutes. Repeat this on alternate hours. On the odd hours compress the artery for one minute and release for ten minutes. Local heat should be given beginning at 120 and slowly increasing to 180°-200° for one half hour periods twice per day. The Bier suction treatment has been employed with beneficial results in certain clinics. The advocates of sympathectomy operations have reported a large number of successful (?) cases and also a goodly number of injections of alcohol into the sheath of the vessels under procaine anesthesia. It does not seem to me that a case has been made out for this method of treatment. Many believe that amputation, under the guidance of Pachon's oscillometer or preliminary exposure of the femoral[57] artery to determine the extent of the thrombosis, is the only rational treatment where ulceration or gangrene has developed. Some who regard amputation as an ultimate necessity feel it should be limited to the periphery, thus avoiding too radical measures.

In view of the two notable efforts that Nature puts forth to take care of the obstruction, viz; the canalization of the vessels and the development of collateral circulation which is abundantly able to care for a very large redistribution of the circulation, it seems to me that omitting tobacco and advising prolonged rest and postural exercises with such sedative measures as will enable the patient to await the reestablishment of the circulation through collateral channels, is the most reasonable method, reserving amputations as a last resort for toes or low leg amputations at best, no matter what open operative inspection of the femoral may reveal. None of the sympathectomy operations need be considered. As for citrate or Ringer's solution, they may be appealed to as adjuncts of the other methods but they are probably not specifics for the lesions of thrombo angiitis obliterans. The writer, in an article published twenty years ago[58], reviewed the literature and entered more fully into the differential diagnosis, though at that time Buerger's work on the pathology had not come out and *erythromelalgia* was the term I was using to describe these cases. The bibliography of that paper may be consulted.

On reading this over after twenty years have elapsed it is interesting to note that not a great deal has been really added to our knowledge since that period. Then, as now, and for the same reasons, caution was urged against hastening to amputations which could in a great many instances be avoided. Establishment of an adequate collateral circulation was recognized to be what was needed and all that seems to have come out of the past twenty years' experience in observing these cases has been a further recognition of that fact, but only lately has much of any consideration been given to the efforts Nature is making to accomplish this herself. If atten-

tion enough can be focused upon this subject so that early radical operative surgery may be deferred, I am sure surgery will be relieved of an opprobrium which it has unfortunately deserved.

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*To this article is appended a supplementary bibliography.

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THE CIRCULATION IN ARTERIOSCLEROTIC GANGRENE OF THE LOWER EXTREMITY*

BY JOHN J. MORTON, M.D., F.A.C.S.†

IN spite of the fact that mid-thigh amputation is the accepted surgical treatment for arteriosclerotic gangrene of the lower extremity[1], except in a few special clinics, little attention has been given to the preventive medicine side of this problem. This apparent indifference is due to the lack of knowledge of the physiological response to interference with the circulation, and to the relatively poor methods for estimation of the circulatory efficiency. From the surgical viewpoint it is difficult to understand why surgeons have been content with their therapy unless it be from the appeal to simplicity of execution and long bitter experience of failure with other methods. The operation itself is attended by considerable risk; it violates a cardinal surgical principle in that the preservation of function is not considered; it never leaves a grateful patient; and unless it were a life saving emergency measure it would be looked upon as a therapeutic failure.

The criteria for estimation of circulatory efficiency are symptomatic disturbance in function,—cramp-like pains and fatigue on use of

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the limb involved; inspection shows the color changes of congestion, ischemia or cyanosis localized to the affected area, and this may be brought out more strikingly by changing from the dependent to above the horizontal position and back again; palpation reveals the temperature changes, the presence or absence of pulsation in the arteries and the rapidity of return of color on pressure blanching of a suspected part. The more special tests, such as the Moskowicz and the Pachon oscillometer, have not been useful in our hands. The intra-arterial injection of radiographically opaque substances has not been employed as we consider the methods too dangerous for the information which they give. Radiographs of the extremity often give a good idea of the arterial channels. The intracutaneous salt solution test[2] offers a fairly reliable index of viability. Surface thermometer readings at comparative levels on the two sides and deeper tissue temperatures registered by thermocouples incorporated into hypodermic needles are methods of great merit. The graphic record of the peripheral temperature changes following the application of a tourniquet to cut off the circulation, with the time measure of the return to normal temperature after release of the occlusion, is an additional test of value which we owe to Brooks and Jostes[3].

Attempts at more accurate estimation of volume and velocity of blood flow such as the studies of Stewart[4], Blumgart and Weiss[5], Sheard[6], Kegerries[7] and Brown[8] require elaborate apparatus which will never be adaptable to every day use. The findings of these investigators and the difference in interpretation indicate the complex nature of the problem. The many factors concerned in the mass movement of blood make it exceedingly difficult to get a standard. For example, on the mechanical side alone, the force of the pump, the elasticity of the walls, the cross section of the walls, the variation in the capillary bed, the venous pressure, the viscosity of the blood, the changes due to the altered intrathoracic pressure all tend to cause changes in both volume and velocity of blood flow. When it is remembered that chemical and nervous system influences also enter, the complexities increase many times.

Our present knowledge of the effects of alterations in the circulation is mainly derived from studies on injuries to large arteries, and from operations on arteriovenous and other aneurysms. The ligature of large vessels has been carried out almost since the beginnings of surgery. John Hunter's brilliant researches demonstrated the collateral circulation on which success depends. We know that following ligature of a main arterial trunk, there is a fall in arterial pressure below the ligature. At the same time the arterial pressure above the ligature shows an immediate sharp rise, followed soon after by a fall, to be followed in turn by a slower rise. This may be a factor in forcibly dilating collateral channels [Pearse[9]]. There remains a residuary peripheral arterial pressure, but it never returns to the original level even though wide collateral circulation develops. Gooch[10] showed that there was an atrophy and obliteration of the channel above a ligature as far back as the first collateral branch and below for an equal distance. Pearse[11] has demonstrated that if a segment of an artery without branches is isolated between ligatures, it atrophies; if the segment has one lateral branch, it becomes greatly reduced in size but the lumen remains open near the lateral branch; if there are two or more branches, the part between the branches becomes smaller but still remains patent. He has also proved that it is possible to completely remove the main trunk artery in a limb and have collateral circulation develop to such an extent that there is no disturbance in function.

Since the Great War the simultaneous ligation of the artery and vein has received much attention. German[12 13], French[14] and English[15] investigators showed, during the war, that the incidence of gangrene was lower and function better when the main vein was tied at the same time as the injured artery. Ligation of the vein raises the residual arterial pressure in the artery below the ligature [Von Kend[16]]. Brooks and Jostes[3] showed by thermocouple readings in the foot that the temperature dropped after ligation of the iliac artery and that it dropped still farther when the iliac vein was tied. There was an increase in arterial pressure at the time of vein ligation but a greater proportional increase in venous pressure. Holman and Edwards[17] claimed a new principle for vascular surgery when they demonstrated that the minute volume flow was much increased from the divided peripheral artery on occlusion of the vein and that the higher the vein was ligated, the more effective the volume output. Pearse[18], however, proved that the increased arterial pressure and blood volume flow were but transient phenomena which slowly diminished to the previous level as the collateral circulation increased. The important result of the ligation of both the artery and the vein at a higher level is in the richer distal vascular bed. This richer collateral development was visualized by roentgenograms after intra-arterial injections of opaque solutions.

Our knowledge of conditions following partial occlusion of a large artery we owe to Halsted and Reid[19]. There is a fall in systolic, a rise in diastolic and consequently a diminution in pulse pressure below the constriction.

In advanced arteriosclerotic disease of the extremities there must be, in effect, a partial occlusion of the arterial circulation. This leads to a smaller volume flow. The pressure above the occlusion is increased over that below. The systolic pressure and the diastolic pressure below the diseased area must come nearer together, resulting in a low pulse pressure. Gan-

grene will result if the velocity and volume of blood flow is not sufficient to maintain life. Trauma and infection may hasten it.

It has been definitely proved that ligation of the vein simultaneous with arterial occlusion improves function, diminishes gangrene, increases residual arterial pressure and immediate peripheral arterial flow, and finally promotes a more extensive collateral circulation. On such grounds it would seem reasonable to assume that ligation of the deep veins might have practical value in the prevention and treatment of arteriosclerotic gangrene. Accordingly, ligation of the popliteal vein has been carried out in the surgical clinic of the University of Rochester, during the past year, on patients presenting this condition. The first trials were looked upon as experiments, which, even if complete failures, would allow the patient to still have the accepted best surgical treatment without jeopardy. Careful study of the results so far obtained makes it certain that there is considerable merit in the method.

Up to the present time the popliteal vein has been ligated on nine individuals with gangrene of the foot. Seven of these histories have been reported in detail in a publication now in press[20]. The patients were carefully studied by all the methods previously determined to have value, to get an estimate of the circulatory efficiency. A skin thermometer of the aneuroid type gave an accurate comparison of the surface temperatures of the two sides. The deep temperatures of the limb were measured by thermocouples incorporated in hypodermic needles and inserted into the gastrocnemius muscles at similar levels. These thermocouples consist of hot junctions of copper and constantan wire fused in the point of a needle and similar cold or constant junctions in a thermos bottle. The difference in temperature between the junctions causes a current which is measured by a microammeter. The microammeter has been previously interpolated into degrees of temperature by calibration.

Ligation was easily performed under local anesthesia. The condition and pulsation of the artery was observed at the same time. The vein was then doubly tied and divided. Surface and deep variations in temperature were recorded at intervals. The results have been quite gratifying. The patients subjectively get relief from the crampy pains, sometimes almost at once. There is a feeling of warmth and comfort in the foot; the foot "feels alive" again.

The surface and the deep temperatures of the foot rise in the course of an hour or longer, depending, presumably, on the circulatory efficiency and reach a higher level than on the unoperated side. The only exceptions in the series have been in those cases in which no pulsation could be made out in the popliteal artery at the time of operation. These patients, (three in all) showed no increased warmth in the extremity and two of them required amputation later. Perhaps ligation of the femoral vein should be used when the popliteal artery is found pulseless. We intend to test it on the next patient who shows this condition. The elevation in temperature may last a long time; in one case it lasted 48 days at least. Leriche[21] found the raised surface temperatures persistent for over a year following periarterial sympathectomy. The six patients with pulsating popliteal arteries have lost only those toes or portions of them which were gangrenous at the time of operation. Often the really gangrenous tissue is much less in amount than first appearances suggest. Sometimes it is confined to the skin and subcutaneous tissues and does not involve the deeper structures. Amputation has been avoided in all six of these patients, but it is too soon to estimate the actual value of the operation.

We have not satisfied ourselves as to the real cause for the functional improvement or the elevation in temperature. If we may be permitted to speculate, it may be that the balancing of the circulation is the cause: the equalization of the inflow and outflow channels. Halsted[22], that master of vascular surgery, said in regard to aneurysms, "Some degree of equilibrium of the arterial and venous systems must be maintained".

Or again, it may be peripheral surface redistribution; or increased capillary volume; or increased unit velocity of the blood already present; or even, perhaps, a vasomotor phenomenon similar to the results obtained by Leriche in periarterial sympathectomy.

On surveying the literature after we had tied the popliteal vein several times for arteriosclerotic gangrene, it was found that the operation had been used formerly by Oppel[23]. A brief extract in the *Centralblatt für Chirurgie* refers to his article on the subject, which is written in Russian. He ligated the popliteal vein in six cases and found that the extremities kept their color and heat without edema; also there was noted a marked hyperaemia of the feet and toes. Brooke[24] has ligated the femoral vein and at the same time performed periarterial sympathectomy to insure better circulation in the stump before amputation for diabetic gangrene. Lewis and Reichert[25] have improved the collateral circulation by ligating the femoral artery in thromboangiitis obliterans. Venous ligation at the same time might make this latter procedure more effective.

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AN ORGANIZATION FOR SUPPLYING HUMAN MILK

BY FRITZ B. TALBOT, M.D.*

THE problem of obtaining human milk for sick infants was solved, many years ago, in European hospitals by keeping wet-nurses in the hospitals. This solution was only found practical in a few hospitals in this country. For the most part, when it was necessary to obtain human milk for sick infants a healthy nursing mother had to be found and persuaded to act as wet-nurse. Such foster mothers were easily obtained in some communities, as in the *ante bellum* South, and in Japan, but more often than not they were found only with the greatest difficulty. Twenty years ago the writer spent the greater part of three days travelling on electric car lines before he was able to obtain a satisfactory wet-nurse. If this had been an emergency, the baby might have died before the milk was obtained.

During the year 1910 human milk was obtained in two different ways by two Boston hospitals. The Massachusetts Babies Hospital had resident wet-nurses, and the Boston Floating Hospital, following the plan used successfully by Dr. Francis P. Denny, had a trained nurse go to the homes of nursing mothers and collect their milk (Talbot).

The lack of an available supply of human milk for private practice led to the establishment of the original Wet-nurse Directory, in 1910 (Talbot), with resident wet-nurses, at the Massachusetts Babies Hospital. A house was purchased about two years later at 63 Binney Street and conducted with a cook-housekeeper, under the direct supervision of a registered nurse. Five to eight unmarried mothers were always in residence with their babies. Milk was either drawn and sent out in bottles or the wet-nurse and her baby were sent into the home. This method of meeting the problem was found to be very costly because of the high overhead expense, so that in 1927 the home was sold and the milk collected at the homes of healthy married mothers. The Directory then moved to 270 Commonwealth Avenue and increased its staff until now it consists of Miss Cornelia MacPherson, General Director, Miss Hazel M. Keene, Assistant, two trained nurses, and one half-time worker.

The amount of milk collected has increased very rapidly with increasing demand. During 1927—174,466 ounces were collected. This is 94 per cent. more than was collected in 1926. The supply has kept pace with the increasing demand and, so far as can now be foreseen, can continue to increase indefinitely. A suddenly augmented demand sometimes cannot be met immediately, but with a little notice the requisite amount can always be supplied.

The office and laboratory equipment includes an electric refrigerator, a large sterilizer, and the necessary appliances for pooling and pasteurizing milk.

The nursing mothers are referred to the Directory by maternity hospitals, obstetricians, and Community Health Centers. They are ex-

*For record and address of author see "This Week's Issue," page 642.

amined physically by a physician and if the Wassermann test has not already been made, it is done. The nurses keep a personal and social history of the mother, with records of pregnancies and her health. The babies are weighed regularly in order to be sure that the mother is not depriving her own infant of any of its rightful heritage. If the gain in weight is regular and progressive in the normal curve of growth, it is assumed that the health of the baby is satisfactory. The health record of these babies has been extremely good and meets, if it does not excel, the record of the general population. The nurse continually reminds the mother that only surplus milk will be bought.

METHOD OF COLLECTION

The mother is taught how to sterilize the funnel, pitcher, and other utensils used, and is shown by the nurse how to express the milk from the breasts. She is given instruction as to diet and personal hygiene, and is aided in every way in simplifying her household work and maintaining her health. After the milk is put in the bottle, a sterile cork is introduced and the bottle is placed on the ice ready for collection. The nurse visits daily, takes away the milk, and leaves a fresh set of sterilized bottles for use the next day. Each mother is supplied with a number on a ring which is placed over the neck of each bottle for identification.

The milk of each individual mother is examined chemically and bacteriologically for dilution or impurities once a month, and the pooled milk once a week. The entire day's supply is pooled at the laboratory, strained, bottled, and pasteurized. Each set of bottles is labeled with the name of the baby who is to receive it, packed in ice, and placed in small boxes (8 bottle size) ready for delivery. The surplus, or emergency supply, is placed in an electric refrigerator which keeps it at a temperature of 40 degrees Fahrenheit. If the milk that comes to the laboratory is found to be sour, no credit is given to the mother for that day. If the chemical tests show that the milk has been watered or cow's milk has been added or substituted, the mother is dropped from the list and a new mother taken on. This has been necessary in only one case.

The average amount of milk collected daily from each mother is 15 ounces, but some mothers have given 54 and even 72 ounces daily. Some mothers have produced an appreciable excess of milk for a year. They are paid seven cents an ounce in each case, at the end of each month. The usual printed pay envelope is used and returned to the office as a receipt. The average monthly pay is $28.00, but in a few instances they have received as much as $100.00 a month. This has been used in various ways. Sometimes it supplements the family budget and makes a better home possible, or furnishes extra necessities or comforts for the family. In other cases it is used to pay for the confinement, or is placed in the savings bank for the future education of the baby. Evidence that the pay has been satisfactory is the fact that the mothers often return during successive periods of lactation.

Forty mothers are always kept on the list. As soon as one is discharged, another is taken to fill her place. They take pride in the fact that they are helping out some other mother's child, and they follow with keen interest the progress of the babies they are helping.

The mothers live in various parts of Boston, and it is necessary for the Directory nurses to make a daily round of calls over given routes. This is done in automobiles which are equipped with iceboxes in which the milk is kept cool during its transportation. The devotion of the nurses is evidenced by the fact that even during the worst winter snow storms they never failed to complete their rounds.

The price charged to the public ranges from twelve to thirty cents. In private cases the charge is thirty cents an ounce. This is reduced according to the circumstances of the family, after investigation through the family physician, or by the nurses themselves. Semi-private cases in hospitals are charged fifteen cents, and hospitals are charged twelve cents an ounce, which is less than cost.

The total amount of milk sold in 1927 was 142,680½ ounces, of which 83,773 went to charitable institutions, and 58,907½ ounces to private cases; 27,486½ ounces were given away to worthy cases; of this 12,523 ounces went to institutions and 14,963½ ounces to outside homes. It is striking that of this latter list there were at one time seven pairs of premature twins.

The milk has been shipped to all parts of New England, and even as far as Saratoga Springs, New York, with success.

The contrast between the present efficient delivery, at all times of day and even at night during emergencies, with the long delay and worry of twenty years ago, hardly needs comment. An unknown number of babies owe their health, if not their lives, to the efficiency of the Directory.

The milk has been used in many kinds of conditions. The premature baby's chances of life are increased many fold by its use. The starved new-born infant is given a good start before its own mother's milk "comes in". It gives a baby undergoing surgical operations a better chance of recovery, and puts the least possible strain on the digestion during infections, thereby enhancing the possibility of the child's regaining his health. This applies especially to the diarrheal diseases during the hot months of the summer.

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VERMONT STATE MEDICAL SOCIETY

THE NEW ASPECTS OF THE CANCER PROBLEM*

BY GEO. A. SOPER, PH.D†

THERE are two ways of combating the scourge of cancer: one through the discovery of new facts and the other through the fullest and most practical employment of the facts which are already known. While I have nothing in the least sensational to report as to new discoveries, there has been an encouraging advance along the second line of attack.

We are perhaps no nearer to an understanding of the causation of cancer than we were a dozen years ago, in spite of the many supposed discoveries which have been widely published by the press; but the world has made progress during the last few years in recognizing the problem in its true proportions and in devising means for dealing with the conditions to which it gives rise.

This is particularly true with reference to the need of early treatment and the provisions in the way of clinics and hospitals which should be made. The next great step should be to provide these facilities whenever and wherever they need to be provided.

Let us look for a moment at some of the new aspects of the cancer problem as they are revealed from the practical point of view.

First, and perhaps most remarkable, it has come to be recognized that cancer is not a disease which is merely a private matter between the patient and his family physician. As a rule, the family doctor can do little by himself in curing even an early case of cancer, because, with the exception of skin cancer, he can seldom diagnose it soon enough, and for the added reason that surgery and radiation are the remedies called for and he is rarely skilled in the use of either.

It was declared at the international meeting on cancer control held in the United States in 1926, that cancer was a disease which called for team-play and that each member of the team ought to possess exceptional skill and ability. In a paper read before the American College of Surgeons at Detroit, October 6, 1927, Dr. Robert B. Greenough said that for the best results in the diagnosis and treatment of cancer all the resources of a first class, general hospital were required.

Working on this idea, there has been organized at the Massachusetts General Hospital what is called a "tumor clinic and consultation service," the object of which is to focus on cancer patients all the resources of that great institution which can be helpful in diagnoses and treatment. The clinic is notably successful. It affords to the patients who apply the best possible opportunity to be cured.

It may be of interest to you for me to describe the tumor clinic in the Massachusetts General in Boston.

The tumor clinic is organized with a staff composed of members of the hospital staff detailed to this service. There is a group of nearly twenty physicians to cover the special subjects or to act as consultants. Dr. Robert B. Greenough, Chairman of the Harvard Cancer Commission and Chairman of the Advisory Council of the American Society for the Control of Cancer, is Surgeon-in-Chief.

There are two rooms in addition to examining rooms, with the necessary instruments and apparatus needed for examination, all in a convenient part of the hospital and in close relation to the X-ray department. The full time services of a clinic secretary-stenographer and nursing attendants are provided. The clinic is in operation as an out-patient department daily. Cases may be referred to it from any department of the out-patient division of the house. The service of the clinic is not in any way obligatory as regards cases entering the hospital. All tumor cases discharged from surgical wards, however, are referred to the clinic as a matter of routine for supervision of subsequent treatment and for follow-up. No beds are assigned to the clinic in the wards but, if desired, the services of the staff of the clinic may be called upon by surgeons on duty in the house for operation or for supervision of cancer cases in the wards. Special emphasis is laid upon the fact that, with the exception of follow-up work, which is obligatory, the services of this clinic are supplied only at the request of the out-patient or house surgeon under whose care the individual patient comes.

The clinic is open every week-day with the clinic secretary and one or more members of the staff present to deal with any case that may be referred. There are special days for (a) blood diseases; (b) general surgical cases, including breast, bone, face and mouth cases and miscellaneous cases; (c) superficial skin lesions; (d) nose, throat and esophagus; (e) general, such as eye and rectal cases; (f) gynecological and genito-urinary cases. The clinic was started in April 1925.

The object of clinics is in no sense to deprive practitioners of their proper practice and when this is understood, as the American Society for the Control of Cancer thinks it generally can be, little opposition may be anticipated in their establishment. The Society is not unmindful of the dangers which lie in the way of conducting

*Read before the Vermont State Medical Society at Middlebury, October 13, 1928.

†For record and address of author see "This Week's Issue," page 642.

cancer clinics and it always insists upon knowing how the medical profession regards the enterprise before it endorses the idea of establishing one.

The Society for the Control of Cancer believes that cancer clinics should be established in general hospitals throughout the United States in order to afford the best possible chance for the cancer patient and to relieve the practising physician of the responsibility of patients whom he cannot cure himself, but who constitute a serious and usually fatal difficulty in his hands.

Cancer clinics are being established in the principal cities of Massachusetts, in accordance with mandatory legislation by the state. Responding to a strong popular demand, a bill was passed by the Legislature requiring the state departments of health and welfare to make a survey of the resources which are available for the diagnosis and treatment of cancer, the idea being that if there was any considerable lack, the commonwealth should see to it that the deficiencies were supplied.

The investigation revealed the fact that there were many cases demanding medical care beyond that which the patients could obtain. Legislation was then enacted calling upon the state department of health to establish clinics and a hospital where the best possible medical skill could be devoted to the diagnosis and treatment of cancer. Consequently, in June, 1927, a special hospital for cancer was opened near Norfolk, the Governor of the State, the President of the State Medical Society, the Chairman of the Harvard Cancer Commission, the Health Commissioner, a representative of the American Society for the Control of Cancer and the head of the cancer clinic at Lynn making addresses.

The significance of the Massachusetts crusade is greater than might at first appear. For the first time in the history of our country a state has definitely recognized its obligation to take active steps for the control of cancer by making available to everybody adequate facilities for the diagnosis and treatment of the disease and teaching the public what it should know for its own protection. It is earnestly hoped that it will not be long before comprehensive programs for the control of cancer will be carried out in many other states.

If Massachusetts has been the first state to develop a cancer program, New York has been the first city to recognize that cancer is a disease which should be combated with official energy and public funds. The Department of Welfare of the City of New York in September, 1923, established a cancer institute and hospital for the care of indigent cases, whether in their incipient or advanced stages. This work is done under the Department of Welfare, Commissioner Bird S. Coler, and under the immediate direction of Dr. Isaac Levine, whose researches and writings are well known to cancer students.

During the summer of 1927 the city of Detroit through its Department of Welfare established a division on cancer and is about to begin epidemiological investigations on a broad scale in connection with this disease, and to conduct a cancer clinic. It is interesting to know that this continuous campaign against cancer which has been inaugurated by Detroit has followed a series of intensive campaigns called "Cancer Weeks" which have been carried on in Detroit for the last four years. Far from being tired of cancer campaigns, the public has welcomed these cancer week activities. Large numbers of persons have applied to the temporary cancer clinics which have been held on these occasions for diagnosis and advice.

Lest it be thought that only the eastern country is alive to that new aspect of the cancer problem which required the establishment of clinics with the team play which they afford, mention may be made of the clinic at Denver, Colorado. I could as well describe the one at Minneapolis or St. Louis or Atlanta.

The Denver Clinic was opened July 30, 1926. It is in the Denver General Hospital. It was brought into existence through the leadership of the superintendent, Dr. Edgar A. Bocock, who, after making a careful study of the whole question came to the opinion that a clinic was needed and that no serious difficulty lay in the way of establishing one. It is a pleasure to say that the Denver Clinic is a notable success.

Any person in the state who is unable to pay a private physician for a thorough examination for cancer can receive a careful study and advice here without cost. People come to the clinic not only from Colorado but from other states. During the first year 719 persons from 7 states were examined. Of these 78 or 11 per cent. were found to have cancer. A large number were in such an early stage of the disease as to afford a good prospect of cure.

The oldest institution which was established exclusively to combat cancer in the United States is the New York State Institute for the Study of Malignant Disease. It was started at Buffalo in 1899 at the instance of the late Dr. Roswell Parke with a small appropriation from the legislature. This institution is now spending about $150,000 a year for research and the treatment of the sick. The institute at Buffalo, which is under the direction of Dr. Burton T. Simpson, is one of the best known centers for the investigation of cancer in the world. It is particularly worthy of mention here, because of its historic position and for the reason that its establishment illustrates a belief which has been frequently expressed, that cancer would surely yield up its secrets, if only enough concentrated scientific thought could be focused upon it. It was under that supposition that the Imperial Cancer Research Fund was established in England in 1904 and the British Empire Cancer Campaign was organized in England in 1923.

The public and the medical profession seem

forever unwilling to regard cancer as unconquerable, and it is very fortunate that this hopeful attitude toward it so generally exists.

There is another new aspect of the cancer problem to which I must invite your attention. The American Public Health Association some months ago appointed a committee to draw up a report as to what departments of health should do about cancer and it is just about to submit its report.

It recommends, first, that departments of health shall recognize the cancer menace in its true proportions and take steps to deal with it accordingly. A program is proposed in accordance with which the organized medical profession, departments of health and the American Society for the Control of Cancer shall carry on a well-considered war against the disease. There are to be surveys to determine the number of cases and the extent to which provision needs to be made for them, facilities for making pathological examinations and assisting in the diagnosis of doubtful cases, instruction of the general public as to the early signs of cancer and the proper course of action for cancer patients to take. Physicians are to be encouraged to make clinical studies and autopsies, to read papers and discuss them before medical societies.

Briefly then, the general public and the medical profession (and soon we will be able to say the public health officials) of our country are engaged in a concerted warfare against cancer. They recognize that it is not a disease which can be satisfactorily dealt with between the patient and his physician, but one which demands special provision of skill and equipment for early diagnosis and proper treatment. It is essentially a hospital disease and one which calls for all the resources of well-equipped general hospitals. The solution of the cancer problem is not in sight and there is no reason to suppose that it will soon be found. It is well to hope for the time when cancer will be entirely within control, but meanwhile, it is our duty to make use of every practical fact and opinion to subjugate it as far as possible with the facilities which we have at hand.

Discussion

Dr. P. E. McSweeney: I am sure that most of you, in the last two or three years, have heard something about cancer from me. I notice that every little while some of you are sending your cancer patients to the hospitals. There is no question but that we have a very serious problem in Vermont in trying to control cancer. I do honestly believe that there has been quite an improvement made in the last two or three years. I believe that the doctors are waking up to the fact that some varieties of cancer can be cured. We now have many cases three and four years, clinically free of the disease, and some of them are in the fifth year period. This is particularly true of the skin cancers, and cancers of the lip. We are not having such good results in cancer of the breast and cancer of the uterus. It is not the fault of the doctors, though. As an example we have now in our hospitals in Burlington two or three cases that never saw a doctor until the cancer had so far advanced that it was absolutely inoperable. I believe that the way we are going to reduce the death rate in Vermont is by early diagnosis. All doctors in Vermont are making a much earlier diagnosis than some years ago, and they are certainly treating their cases better.

We have not very much money in this state to take care of people who are not financially able to go to the hospitals, so our hospitals in Burlington have all agreed that they will treat the patients free of charge, but they cannot keep them for long periods of time. Dr. T. S. Brown, Superintendent of the Mary Fletcher Hospital, has said they will take cases there for a reasonable time, and furnish them with X-ray, radium, or surgical treatment, as required.

One thing we would like to have you men do is to meet some of the rich people in your communities and induce them to leave $5000, $10,000, $20,000 or $100,000 to the hospitals in any town in the state, and have that money used in such a way that the people who cannot afford treatment can get it free of charge from the hospitals. I want to say that we had in Burlington, a woman some years ago, in 1889, who left a fund for the treatment of cancer. They have about $2500 a year for use in these cancer cases. That money, which was left by Miss Louisa Howard, has done an immense amount of good. The Cancer Relief Society of Burlington, which was founded by Miss Howard, will give a certain amount of money to a poor person suffering with cancer. The amount varies from $5 to $10 or $12 a week. It is not much but it does furnish considerable help in some cases. We want more funds of that kind. If we can once get it before the people that cancer relief is a worthy object, more cancer relief funds will be established. Furthermore, I believe cancer clinics should be established and a number of free beds for cancer patients donated to hospitals in different parts of the state, where these people can be taken care of. I am sure that the doctors are doing their share, professionally. Now, what the physician wants to do is to interest the lay people, so that we can have places where these cancer patients can be treated, the same as they are in Massachusetts. I am in hopes that our State Board of Health will take up this subject. I recently talked with our Secretary, Dr. C. F. Dalton, and I am sure they are receptive and would be willing to do almost anything in order to bring about the results of which we have just been speaking.

Dr. Chas. F. Dalton: Since the State Board of Health has been brought into this matter I think perhaps it is just as well for me to take

care of two or three things on this subject. Most of you remember that some years ago we did have a cancer campaign in this state, with speakers from abroad, at which time we went to several of the larger cities of the state and had meetings, with lectures and pictures, etc. That was a spasmodic effort, which may or may not have done some good. But nothing was done for some time after that until a few years later Dr. Soper's society asked that a local cancer society be formed in this state, and suggested that the local chairman be connected with the State Department of Health. Unfortunately, the State Department of Health is very much reduced in its funds, and the legislature seems to reduce it further nearly every session, and being in that condition we had neither money nor personnel to put into that work. Fortunately, there was a man interested sufficiently to give his time and money, and that was Dr. P. E. McSweeney, and he and his son have carried this on, practically without help, except such voluntary assistance as they have called in from time to time to aid them in putting across meetings. Dr. McSweeney knows that the State Board of Health is willing and anxious to do this kind of work, if we only had the facilities. We feel that he is doing very well at present, but he feels that more should be done. Every once in a while Dr. McSweeney asks me, "Do you think it is time to start a cancer clinic?" I always reply that we tried to start clinics for venereal diseases, and they didn't go very well, and I am just a little bit afraid, if you start cancer clinics they might not prove successful, and if they do die out you are just that much back, and you have that prejudice against a cancer clinic which you wouldn't have if you waited a little while and be sure it is going over. The question is still up, Shall cancer clinics be started in various parts of this state? And it is by no means decided, but I feel it is a question that should be put squarely up to this Medical Society. If you see the need of cancer clinics in this state you are the men to put it through. You have to conduct these clinics, and you will have to send patients to the clinics. If it is the thing for the State to furnish money to put into the cancer problem, we have plenty of precedent on that. In Massachusetts they have already established a cancer hospital, which I believe is the pioneer, under state control. In New Hampshire the legislature passed a law directing the State Board of Health to make a survey of the cancer problem in New Hampshire, and ascertain what was being done in regard to this problem. Nothing of this kind has been brought up in our legislature, but I feel it is coming because people are getting interested in the subject. The advertisements which Dr. McSweeney has had put into the papers, saying, "if you have such symptoms, see your doctor, you may have cancer," have helped to create interest, among people, and we know that people are more conversant in regard to cancer now than they have been at any time in our experience. And so we are still holding up on this cancer clinic matter, and I wish that you could talk it over among yourselves and talk with Dr. McSweeney and members of the State Board of Health, and if we could get some ideas as to whether this ought to be done, or not, it would help a great deal in the decision of this question, which I feel must be decided in the next few years, and possibly within the coming year.

DR. EDDY: I wish just to give a report of what has been done in an educational way in this section. Through the efforts of Dr. McSweeney, who has given much time and energy in putting the campaign before the people here, we have speakers provided who have given talks in most of the towns of the county and articles have been presented in the papers of this section setting forth the truths in regard to cancer. I think there has been quite a little interest evidenced on the part of the public as a result of the efforts of Dr. McSweeney in our section.

DR. SOPER: I am glad, Mr. Chairman, to say how gratified I am at the way in which you have grasped what I have said. I don't know when I have heard a better summary than you have given of the intention which I meant to convey.

I appreciate deeply what the State Department of Health has done. I think it is clear to every one that the Department is ready, just as Dr. McSweeney has been ready, to do everything within reason.

The great question is, what is there to do? I believe we have a clear case. The family physician is surely the key man in this whole question. It is much more gratifying to see him meet the cancer menace at his own initiative than in response to a demand from the public.

I heartily endorse the suggestion that this Medical Society pass some resolution, or give some consideration to the endorsement of cancer clinics, not everywhere, but in strategic points where they will serve to educate the public and be of real help to patients and physicians in the treatment and diagnosis of this disease.

NOTE—This closing discussion not edited by Dr. Soper.

MISCELLANY

REPORT OF MEDICO-LEGAL COMMITTEE

To the Vermont State Medical Society:

The medico-legal committee report with pleasure that the past year has been a successful one. Though several complaints and threats have been considered by the committee no case has been brought to the attention of the courts.

Because of our accumulation of a reasonably sized surplus, and our better expectations we recommend that the amount of the annual dues allotted to the work of this committee be reduced to $4.00.

Respectfully submitted,
Medico-legal Committee,
EDWIN A. HYATT, *Secretary.*

REPORT OF THE NEW ENGLAND MEDICAL COUNCIL

To the Members of the Vermont State Medical Society:

A session of the New England Medical Council was held at Belgrade Lakes in connection with the Maine State Medical Association, June 20th, to discuss the following program:

Popular Education Relating to the Practice of Medicine and Problems Incident Thereto

1. Education of the Public with Reference to the Cults.
   Paper by Dr. T. J. O'Brien, Vice-President Massachusetts Medical Society, 501 Beacon Street, Boston.
   Discussed by Dr. James S. Stone, 264 Beacon Street, Boston; Dr. L. C. Kingman, 76 Waterman Street, Providence.
2. Education of the Public with Respect to Public Health Problems.
   Paper by Dr. William G. Ricker, St. Johnsbury.
   Discussed by Dr. George Blumer, 195 Church Street, New Haven; Dr. B. U. Richards, State House, Providence.
3. Round Table Discussion of the following subject: "Education of the Public with Respect to Legislation Affecting Medicine with Especial Consideration of How to Get the Support of the Physicians.
   Dr. Frank H. Wheeler, 27 Perkins Street, New Haven.
   Discussions by Dr. John M. Birnie, 14 Chestnut Street, Springfield; Dr. Robert Rowley, 79 Elm Street, Hartford.

Two members of the Vermont Society were present, and the paper written by our Secretary, Wm. G. Ricker, was read, Dr. Ricker himself being unable to be present. All of the New England State Societies were represented. Discussions of mutual interest to all of the component societies were entered into, particularly the matter of medical registration. A feeling of mutuality among the states was manifested, and most of the delegates remained over another day to more fully discuss with the Maine Association her more particular problems. A detailed report of the meeting will be available to all members through the NEW ENGLAND JOURNAL OF MEDICINE.

EDWIN A. HYATT.
E. H. ROSS.

REPORT OF THE PUBLICATION COMMITTEE

In accordance with the vote of the House of Delegates last October, 1927, the Publication Committee through its chairman completed negotiations with the *Boston Medical and Surgical Journal* for the publication of such papers, articles, and material as might be submitted by the Vermont State Medical Society. This material was submitted and first appeared January 26, 1928, and since then contributions have appeared regularly.

On the completion of the one hundredth anniversary of the publication of the *Boston Medical and Surgical Journal*, the name was changed to the NEW ENGLAND JOURNAL OF MEDICINE. The Vermont State Medical Society pays to the NEW ENGLAND JOURNAL OF MEDICINE the sum of $1.00 per year per subscriber, all members being rated as subscribers.

The committee feel that this has been a wise action. However, it is for the members at large to decide. This relationship should be maintained at least one more year before any question of change is considered. At that time we hope that it will be generally considered successful.

Respectfully submitted,

WM. G. RICKER,
C. F. DALTON,
J. A. WARK.

REPORT OF THE NECROLOGY COMMITTEE

The Vermont State Medical Society has suffered the loss by death of an unusual number of its members during the past year. These have been reported from time to time in the Vermont issue of the NEW ENGLAND JOURNAL OF MEDICINE, to which reference is made for a full report. The following deaths have been thus reported: W. E. Putnam, Bennington; George H. Branch, Grand Isle; R. T. Johnson, Concord; Barnet Frank, Burlington; Fremont Hamilton, Brattleboro; John D. Brewster, Windsor; Eaton V. Reynolds, Fairfax; William W. Townsend, Burlington; Ernest O. Chellis, Narrowsburg, N. Y., formerly of Windsor County; J. A. Bouche, Montpelier; E. G. Sprague, Barre; Chas. E. Chandler, Montpelier; Ray Ernest Smith, Rutland; George P. Collins, Ferrisburg; Antonia F. Elie, Island Pond; John S. Miles, Pownal; Ansel I. Miller, Brattleboro. This includes several who were not at the time of their death, members of the State Society.

Respectfuly submitted,

L. A. RUSSLOW,
J. W. ESTERBROOK,
H. S. PIERCE.

PROVISIONAL PROGRAM OF THE ONE HUNDRED FIFTEENTH ANNUAL MEETING OF THE VERMONT STATE MEDICAL SOCIETY

TO BE HELD AT THE COLLEGE OF MEDICINE, BURLINGTON, VERMONT, THURSDAY AND FRIDAY, OCTOBER 11 AND 12, 1928

Thursday Forenoon, October 11th, at Nine O'Clock, at the College of Medicine

1. Call to Order by the President, S. S. Eddy, Middlebury.
2. Prayer.
3. Address of Welcome. C. H. Beecher, M.D., Mayor of Burlington.
4. Reports of the Officers and Committees.
5. Reception of the Delegates from other Societies.
6. Vice-President's Address, "Undulant Fever," C. F. Dalton, Burlington.
7. Paper, Harry F. Perkins, Professor of Zoology, University of Vermont. Title: "Survey of Rural Vermont."
8. Paper, Mr. A. W. Lawrence, Springfield, Vt., Master of the Vermont Grange. Title: "The Situation in Rural Districts as Regards Medical Services."
9. Address: E. A. Crossman, Boston, Inspector in Charge of Tuberculosis Eradication, New England Division, U. S. Dept. of Agriculture. Title: "Proper Standards for the Production and Shipment of Milk."

Thursday Afternoon at Two O'Clock at the College of Medicine

10. State President's Address, S. S. Eddy, Middlebury. Title: "Medicine's Search for the Fundamental Causes of Disease."
11. Address: Alfred T. Bazin, Montreal, President Elect of the Canadian Medical Association. Title: "Varicose Veins."
12. Address: W. S. Thayer, President of the A. M. A. Title: "Simpler Methods of Diagnosis and Therapy."

13. Paper: Roger I. Lee, Boston, Former Professor of Hygiene at Harvard University and Visiting Physician at the Massachusetts General Hospital. Title: "Treatment of Pernicious Anemia Especially by Liver."

FIXED SESSION OF THE HOUSE OF DELEGATES, 5 O'CLOCK, COLLEGE OF MEDICINE

List of members, reports of the committees and the order of business are printed in pamphlet form. Copies may be obtained at the registration desk.

Thursday Evening, at Seven-Thirty O'Clock

The Annual Banquet

Anniversary Chairman, W. M. Bryant, Ludlow.

Friday Forenoon, Nine O'Clock at the College of Medicine

14. Report of the House of Delegates.

Symposium on Pediatrics

15. "Some of the Pitfalls in the Physical Examination of Infants and Children." John Lovett Morse, Professor of Pediatrics, Emeritus, Harvard Medical School, Former Chief of the Medical Service, Children's Hospital.
16. "Significance of the White Blood Cell in the Diagnosis of Active Tuberculosis in Children." Kenneth D. Blackfan, Professor of Pediatrics, Harvard Medical School, Chief of Medical Service, Children's Hospital.
17 "The Place of the General Practitioner in a Mental Hygiene Movement." Bronson Crothers, Instructor, Neurology and Pediatrics, Harvard Medical School, Member of the Medical Staff of the Children's Hospital.
18. "Acidosis and Alkalosis: The Changes in the Blood Plasma which cause these Conditions and the Indications for Treatment." James Gamble, Associate Professor of Pediatrics, Harvard Medical School, Chief of the Laboratory at the Children's Hospital.
19. "Some Surgical Complications of Respiratory Infections." James S. Stone, Former Consulting Surgeon, Children's Hospital, Boston.

REPORT OF THE DELEGATE TO THE AMERICAN MEDICAL ASSOCIATION

Acting again as the representative from Vermont in the House of Delegates of the American Medical Association, I wish again to express my appreciation and to emphasize the honor and privilege which you have seen fit to bestow upon me these past few years.

In making this, my annual report, I will not attempt to review the actions of this body day by day, nor even to give you a digest of its proceedings. The transactions in detail have already appeared in the *Journal of the American Medical Association*, in which are printed in full the various addresses of the officers, and reports of trustees, councils, and committees, together with the action upon these various reports by the reference committees, and the final action of the House of Delegates. An abbreviated report or digest of these same transactions also appears in the *American Medical Association Bulletin*, a copy of which has been received by every Fellow of the A. M. A. If these reports have not already been reviewed by the members of the Vermont State Medical Society, far be it from me to impose a third report. Due to the high degree of efficiency with which the business of this body is transacted, a tremendous number of problems are reviewed, discussed, and acted upon during the two and one-half days of the session.

In view of the fact that we are primarily a rural state, I would call attention to the action taken in regard to rural practice. We received a long communication from the Master of the National Grange regarding the situation. This communication received serious consideration and general discussion by men from rural communities and by men from the larger cities, and was referred to an able committee, of which Dr. Dunn of Nebraska was the chairman, and I believe it is worth the space to quote in full the final resolution.

"Resolved, That an official reply to the Grange be formulated by the Secretary of the House of Delegates embodying the following thoughts:

1. That the House of Delegates is keenly alive to the problems involved and recognizes that, although there will always be some inadequacy of medical services in sparsely settled communities, improvement of medical services in rural districts is needed.
2. That the problem is being intensively studied by the Commission of Medical Education (already in its fourth year), the Committee on the Cost of Medical Care, the Council on Medical Education and Hospitals and other bodies.
3. That the problem is fundamentally economic and the solution involves much more than the mere length and costs of medical education.
4. That patience and time are necessary in order to obtain data and evolve methods for solving this problem.
5. That suggestions from the National Grange and information will be welcomed by the House of Delegates and by any of the bodies specially engaged in the study of medical, educational and economic problems."

Your own delegate was the chairman of the committee on miscellaneous business. However, very little of importance was referred to this committee.

It is the desire of the House of Delegates that the transactions receive more universal attention, and I can only urge that individuals devote more care and time in the study of the reports as printed in the *Journal* and *Bulletin of the American Medical Association.*

Respectfully submitted,

WILLIAM G. RICKER.

SECRETARY'S REPORT

The Secretary begs to report the usual activities for the current year.

The annual meeting was held in Middlebury, was well attended, and proved to be a successful and interesting session.

The Secretary would urge all those who attend annual meetings to impress their fellow practitioners, on their return home with the value and importance of these meetings.

The relationship with County Secretaries has been very happy during the past year. A special feature has been the promptness with which annual dues were collected, the Roster on April first being by far the nearest complete since the present incumbent has kept the records.

Attention is called to the supplement of this report showing the increase of membership in the society. The apparent discrepancy between this supplement and the report of the Necrology Committee is due to the fact that the committee have reported the deaths of all physicians to which their attention has been called. Of this large number of deaths only a part were members of the State Society.

On the evening preceding the annual state meeting a conference of County Secretaries was held in the Addison House at Middlebury. This is becoming an annual affair and I believe is proving of value in securing greater interest and co-operation.

At the coming conference recommendation will be made to the County Secretaries to hold meetings at least as often as quarterly and to submit in each and every case, immediately, a report of the meeting for publication.

The outstanding feature of the past year has been the establishing of a more intimate relationship with the other New England State Societies. This began two years ago with the proposal to form the New England Medical Council. Two meetings of the council were held during the past year, the first in Boston in November. In as much as our Vermont railroads saw fit to bury themselves under water the night before, there was no attendance from Vermont.

The second meeting was held at Belgrade Lakes at Maine, in June, at the time of the Annual Meeting of the Maine State Society. A separate report of this meeting is submitted elsewhere.

The Vermont Society in 1927 voted to appropriate a sum not to exceed one hundred dollars for the expenses of this council. The council agreed that each attendant should submit his expenses to the Treasurer of the council who in turn should assess each of the states. The Vermont assessment promises to exceed one hundred dollars. The house of delegates should take action in regard to this matter.

WILLIAM G. RICKER.

SUPPLEMENT TO SECRETARY'S REPORT

	Membership 1927	Membership 1928	Increase	Decrease
Addison	15	15		
Bennington	20	21	1	
Chittenden	73	75	2	
Franklin	29	28		1
Lamoille	9	8		1
Northeastern	47	46		1
Rutland	46	53	7	
Washington	56	54		2
Windham	23	27	4	
Windsor	22	21		1
	340	348	14	6

Classified List of Members with Comparison of 1927

REPORT OF THE TREASURER

For the Year Ending September 15, 1928

GENERAL ACCOUNT

Receipts

1927	
Sept. 17 Balance on hand	$544.80
Nov. 1 Received from Denver Chemical Co., space at annual meeting	15.00
Nov. 1 Received from D. L. Miller, space at annual meeting	15.00
Nov. 12 Received from Vermont-Peoples National Bank, income, Dr. H. D. Holton trust fund	65.00
1928	
Feb. 4 Received from General X-Ray Co., space at annual meeting	15.00
Feb. 4 Received from Talby-Nason Co., space at annual meeting	15.00
Feb. 4 Received from E. F. Mahady Co., space at annual meeting	15.00
Feb. 4 Received from The Wales Co., space at annual meeting	10.00
Received from Addison Co. dues $2 each	26.00
Received from Bennington Co. dues $2 each	36.00
Received from Chittenden Co. dues $2 each (two at $1)	162.00
Received from Franklin Co. dues $2 each	50.00
Received from Lamoille Co. dues $2 each	16.00
Received from Rutland Co. dues $2 each	98.00
Received from Washington Co. dues $2 each	98.00
Received from Windham Co. dues $2 each (one at $1)	61.00
Received from Windsor Co. dues $2 each	40.00
Received from Northeastern Cos. dues $2 each	80.00
Total balance on hand and receipts	$1,361.80

Disbursements

1927	
Oct. 5 Paid the Cowles Press, printing programs and circular letters	$32.58
Oct. 11 Paid the Passumpsic Savings Bank, rent safe deposit box for Secretary	7.50
Oct. 22 Paid Dr. E. T. Wyman, expenses, annual meeting	23.90
Oct. 24 Paid Dr. B. E. Roberts, income, Dr. H. D. Holton trust fund	65.00
Oct. 24 Paid Dr. F. B. Granger, expenses, annual meeting	20.90
Nov. 1 Paid Dr. W. E. McFee, expenses, annual meeting	27.83
Nov. 14 Paid Dr. L. A. Russlow, typewriting obituaries	1.50
Nov. 17 Paid Dr. E. M. Deland, expenses, annual meeting	11.00
Nov. 25 Paid Philip Murray, rent of Town Hall, annual meeting	25.00
Nov. 25 Paid Dr. S. S. Eddy, rent of Grange Hall, annual meeting	12.00
Nov. 25 Paid Middlebury Inn, expenses, tea party and bills of speakers	59.25
Nov. 25 Paid James C. Thompson, services as musician, annual meeting	4.00
Nov. 25 Paid Benjamin E. Rogers, printing signs and material, annual meeting	33.55
Nov. 25 Paid Dr. S. S. Eddy, telephones and cloth for curtains, annual meeting	6.85
Nov. 25 Paid G. R. Cameron, carting tables and labor, annual meeting	2.25
Nov. 25 Paid Lucius Stone, labor, annual meeting	3.00
Nov. 25 Paid Dr. J. J. Ross, postage, annual meeting	1.50
Nov. 25 Paid Wilhelmina C. Hayes, stenographic work, annual meeting	8.32
Dec. 9 Paid Dr. William G. Ricker, salary and expenses, 1927	170.22
1928	
Jan. 7 Paid Susan A. Nott, reporting and transcript of annual meeting	108.23
Jan. 11 Paid the Cowles Press, printing notices of dues	4.90
Jan. 21 Paid T. S. Peck Ins. Agency, Treasurer's Bond	12.50
Mch. 6 Paid Dr. Walter P. Bowers, 1/6 of the expenses at the New England Council Meeting	51.30
Sept. 15 Paid Dr. David Marvin, postage and telephones	6.50
Total disbursements	$699.58
Balance on hand	662.22
Total disbursements and funds on hand	$1,361.80

VERMONT BULLETIN ACCOUNT

Receipts

1927		
Sept. 17	Balance on hand	$173.95
	Received 334½ dues ($1 each)	334.50
	Total balance on hand and receipts	$508.45

Disbursements

1927		
Oct. 18	Paid the Cowles Press printing quarterly bulletin	$115.58
1928		
Apr. 12	Paid BOSTON MEDICAL AND SURGICAL JOURNAL for Jan., Feb. and March	86.34
July 31	Paid BOSTON MEDICAL AND SURGICAL JOURNAL for Apr., May and June	85.75
		$287.67
	Balance on hand	220.78
	Total disbursements and funds on hand	$508.45

MEDICO-LEGAL ACCOUNT

Receipts

1927		
Sept. 17	Balance on hand	$7,370.95
1928		
Jan. 1	Received interest on savings account	122.14
July 1	Received interest on savings account	131.25
	Received from 322½ dues $7 each	2,257.50
	Total balance on hand and receipts	$9,881.84

Disbursements

None.

TOTAL ASSETS

General Account	$662.22
Vermont Bulletin Account	220.78
Medico-Legal Fund	9,881.84
Total assets	$10,764.84

Respectfully submitted,
DAVID MARVIN, *Treasurer.*

To Vermont Medical Society,
Wm. G. Ricker, Sec.:

I have today examined the accounts of the treasurer, Dr. David Marvin, and find them to be correct.

C. K. JOHNSON, M.D., *Auditor.*

Sept. 18, 1928.

MEETING OF THE NORTHEASTERN COUNTIES MEDICAL SOCIETY

August 18, 1928.

Annual meeting of Northeastern Counties Medical Society was held at Willoughvale Farm, on the shore of Willoughby Lake, Tuesday, July 31, 1928, at 3:30. The following officers were elected for the coming year: President, R. W. Adams; Vice-President, R. M. Wells; Secretary and Treasurer, W. B. Fitch; Delegates for one year, A. L. Leonard, B. D. Longe; Delegates for two years, E. H. Ross, C. D. Rublee.

After the business meeting a very interesting talk was given on "Normal and Pathological Physiology of the Liver," and the use of the liver extract in the treatment of anaemia, by Dr. A. M. Hjort of Hanover, N. H.

Professor A. H. Gliddon of Hanover gave a paper on New Methods of Ocular Measurements, and a very interesting case record was given by Dr. J. F. Gile on Staphylococcus Septicaemia. After the meeting a banquet was served by Dr. R. M. Wells at the Willoughvale farm house.

SURVEY OF CHRONIC DISEASE IN BOSTON, MASS., 1927

Made by the Boston Council of Social Agencies, 43 Tremont Street, Boston

(Continued from Page 574 of previous issue)

NURSING AND BOARDING HOMES

When this survey was proposed and during the process of gathering data, there were persistent requests for more information concerning the existence, standards and costs of nursing home care. The term "nursing home" seems to have been rather loosely used to refer to the simple boarding home where the chronic invalid can have board and shelter, as well as to the private home remodelled into a semi-hospital, well equipped and with a resident trained nurse in charge.

An indiscriminate list of such places in Boston and environs, compiled by hospital social workers and physicians, numbered 315. Some of these are known to be excellent; others have proved grossly inadequate; others were not personally known, but included applications for patronage from the woman in charge.

Only 65 patients known to social service departments of hospitals, the Community Health Association and case working agencies were reported by these agencies as being at the time under care in Nursing Homes. It was estimated that several hundreds of patients could be found in unsupervised Nursing and Boarding Homes.

There seems to be general agreement that there is need for some alternative to the hospital or the patient's own home for many chronic sick and invalids. Many of these patients could be cared for in their own homes if there were room and a responsible person to care for them. The reasons for going away from home given in another section, illuminate this subject.

To get at some standard for judgment of the adequacy of the nursing homes used by the hospitals of Boston, a committee of five hospital social workers was appointed to visit the nursing homes so far as practicable and to offer a definition and some standards for designation of a nursing home.

This committee agreed in general that a Nursing Home offers more or less expert care by a resident nurse, with a doctor coming in from the outside as needed. The weekly charge covers board and room, with nursing care but not the doctor's fee. The emphasis is on home atmosphere as opposed to institutional. A family group of adults may well live side by side with the patients, making a definite contribution toward the well-being of the latter by providing normal domestic interests which are missing in institutions. The nursing home is less effective in proportion to the deficiency of home atmosphere, therefore, a limited number of patients is also essential.

The following summary of qualifications for Nursing Homes is the one used by this committee in estimating the quality of the Homes visited and is based on the experience of the committee members over a number of years.

DESIRABLE QUALIFICATIONS FOR NURSING HOMES

1. Reference from doctors of good standing.
2. Reputable physician available in immediate vicinity.
3. Registered, graduate nurse in charge or in residence as a member of the staff, for homes taking more serious cases.
4. Competent and experienced practical nurses for homes taking less serious cases.
5. Day and night service.
6. Knowledge of dietetics with special diets available.
7. Physical equipment to include hospital beds, sufficient modern bathrooms, porches.
8. First floor accommodations, adequate fire protection (in accordance with laws) to be provided.
9. Home to be located in a quiet residential neighborhood within short drive from hospitals and accessible for visiting by friends of the patients.
10. Home to be limited to a small number of patients that it may retain the home-like atmosphere.

A very few nursing homes qualifying under the above standards are available near Boston. The cost is not less than $18. a week for a patient in a room with two or three others and $25. for those in separate rooms. From these figures the rates rise to as high as $75. a week, according to the type of accommodations desired and the amount of nursing required. While the nurses in charge of these homes may take great satisfaction in caring for the patients, the work is a source of livelihood to them and must be paid for. None of these nursing homes is endowed.

The nursing home of the described standard is at present a resource for only those patients who have money regularly available, from whatever source, for their care. We are thus considering a social group with more available resources than are possessed by those usually admitted as free patients to city or state institutions. Nursing homes can never supplant, only supplement the latter institutions. Nursing homes are generally used as a substitute for home care which in a particular case is not available.

The hospital social workers of the City have

had considerable experience with so called Nursing Homes that have proved unsatisfactory because of over-crowding, lack of cleanliness, disregard of medical orders and unkindness to the patients.

There is no supervision of these nursing homes other than the informal over-sight of those hospital social workers who are constantly in close touch with homes to which they transfer patients. The desire for patronage is a spur to standards, and criticisms from the hospital social workers are taken seriously. Up to the present time there is unfortunately no legal registration or supervision of these homes. Private individuals are often not competent to judge, and are sometimes forced by the situation in which they find themselves to accept conditions of which they strongly disapprove.

As a result of the past experience of the committee members and of the investigation undertaken especially for this report, it is believed that every establishment offering care of the chronic or other sick in residential homes, should provide at least for medical and nursing care of good standard and suitable physical and social environment.

Many among the 315 so-called Nursing Homes are more truly boarding homes maintained as a means of livelihood by women, some of them so-called practical nurses. A few are managed by a man and wife. In many instances the old home is all that is left to the owners and boarders are taken so that the home may not be sacrificed. Nursing service, as such, is not provided. The board charged in many of these Homes is from $10 to $12 and $15 a week. According to the social agencies reporting in this study, such homes have been sought by clients who could not be admitted to chronic hospitals because of lack of facilities, and by those who are homeless and would not consider going to Long Island Almshouse Hospital.

The Family Welfare Society reports that some of the more able bodied of the chronically sick insist on staying in lodgings where they take care of themselves, often doing their own cooking. Usually they can attend a clinic. When such a patient becomes too incapacitated to care for himself and the private chronic hospital has no place for him, the boarding home is sought in preference to the Almshouse Hospital. There are no statistics as to the number of such patients. The Overseers of Public Welfare give a maximum of $5. a week for such persons. When the patient has no resources, the difference between that amount and the cost of board must be raised by private agencies.

The Community Health Nurses report that they are often called in to give nursing service to a patient in a boarding home. Not infrequently they find that the patient needs more nursing service than they can give, there is no one who can carry out instructions between their visits and neither the patient nor the woman in charge of the Home, although offering to take invalids to board, can pay for the nursing service needed. In many instances they find on their visit that there are other patients (in one home with twenty boarders, there were five others), who need nursing care.

The whole situation evidently needs further study. It is quite evident that some boarding plan for adults such as is now carried out by the Children's Mission for sick children, would meet a great need. But it should take into consideration, the nursing service as a part of the cost of maintenance. It has been suggested by several of the hospital social workers that a fund for paying board in toto or in part for patients in suitable supervised boarding homes in charge of practical nurses, should be a part of an adequate program for patients incapacitated by chronic disease.

CHRONIC SICK CHILDREN

Seventeen and seven-tenths per cent. of our total were children under 15. In this band of 766 little folk, each of whom was disabled by a lingering illness, 204 of whom were seriously handicapped by heart disease, and 125 by the crippling effects of infantile paralysis, may be found, earnest of the vast problem of underprivileged childhood which Boston must somehow solve. Mere care is not enough. Medical repairs alone will not do. It is a social problem and one for preventive effort. These children are potential citizens. They have life yet before them. With their existing handicap they must remain social liabilities. It is only with constructive help, which seeks to place them on a footing of equality in opportunity with their fellows that the public can hope to salvage them for self-support in life.

In addition to heart disease and infantile paralysis, the chief groups according to diagnoses were: tuberculous spine, 55; tuberculous bones and joints other than vertebral, 50; making with 10 cases of other forms of non-pulmonary tuberculosis a total of 115 with tuberculous condition not pulmonary; syphilis, 7: gonorrhea, 33; arthritis, 19; diseases of the spinal cord (other than tabes and encephalitis) 19; chorea, 44; empyema, 20; congenital malformation, 21.

Of the 626 chronic sick, scheduled in the 18 general and special hospitals on the census day, 133 were children under 15. Thirty-eight of these were in the infantile paralysis group; only 11 in the heart disease class; 10 with diseases of bones and joints; all others, 74.

In the special study of 500 non-resident patients cared for in the hospitals for the chronic sick, 32.0 per cent., or 160, were under 15 years of age. Thirteen of these were victims of infantile paralysis; 76, tuberculous conditions other than pulmonary; 8, chorea; 43, heart disease, and 9, congenital malformation; 11, all other. If this percentage were to be assumed for the entire group of 808 non-residents, there

would have been 258 non-resident children coming into Boston to be added to, or perchance to replace, chronic sick children who live in Boston in our already meagre total of 253 beds provided for such care.

In the analysis of 292 chronic sick patients admitted to the Boston City Hospital, 16.8 per cent. were under 15 years of age. Fractures, heart disease and empyema were the principal ailments.

Among the 270 applicants for admittance to the hospitals for chronic disease, 20.4 per cent. were children under 15. Fifteen of these were choreics; 32 were suffering from heart disease; 3 were arthritics; 2 nephritis; and 3 scattering.

Taking these 766 children as a group apart, their classification by sex and diagnosis was as follows:

DIAGNOSES OF CHILDREN 14 YEARS AND UNDER

		M.	F.	Total
I.	Epidemic, Endemic and Infantile			
	Infantile Paralysis	64	61	125
	Tuberculous empyema		1	1
	" spine	32	23	55
	" bones and joints	32	28	60
	" other forms non-pulmonary	6	4	10
	Syphilis	4	3	7
	Gonorrhea	2	29	33
II.	Arthritis	6	13	19
	Diabetes	2	1	3
	Anaemia		1	1
	Other general	1	1	2
III.	Encephalitis	3		3
	Diseases of Spinal cord	7	12	19
	Cerebral hemorrhage or shock	6	1	7
	Other paralyses	4	6	10
	General paralysis Insane	2	3	5
	Epilepsy		1	1
	Chorea	18	26	44
	Other diseases of nervous system	6	9	15
	Diseases of Eye and Ear	4	2	6
IV.	Heart	91	113	204
	Other Circulatory diseases	1	2	3
	Chronic bronchitis		2	2
	Empyema	12	8	20
	Asthma	2	4	6
V.	Ulcer Stomach	1		1
VI.	Hernia and Intestinal obs.	1		1
	Other digestive	2	1	3
VII.	Chronic Nephritis	3	2	5
	Other G. U. (non Gon.)	2	4	6
IX.	Skin and Cellular Tissue	2	3	5
X.	Bones and Organs Loco	17	14	31
XI.	Con. Deform.	11	10	21
XII.	Early Infancy	4	3	7
XIII.	Fractures	5	3	8
	Other external	4	2	6
XIV.	Ill Def.		1	1
	Unclassified	6	4	10
		365	401	766

The outstanding fact in the presence of this large proportion of children among the chronic sick is the certainty that skillful methods and adequate facilities for physical rehabilitation must be supplied; and that over and above these there must be provided a thoroughgoing process in education and vocational training. It is in this way only that these handicapped children can be fitted for self-support in life.

THE AGED CHRONIC

Forty-one and six-tenths per cent. of our 4316 chronics were 60 years of age or over. The men were slightly more numerous than the women. One hundred and fifteen were diagnosed as senility and senescence. Of all the chronic arthritics found, 58.7 per cent. fell in this age group. Of the 626 chronic patients found in general and special hospitals, Oct. 19, 1927, 24.8 per cent. were 60 years of age or over. Of these 18 had fractures; 36 were suffering from heart disease; 13 had other diseases of the circulatory system; 28 had cancer, and the remainder various among 20 other ailments.

Among the patients admitted to the Boston City and the Massachusetts General Hospitals in the year beginning July 1, 1926 and closing June 30, 1927, twenty-four and seven-tenths per cent. were 60 years of age or over. This percentage tallies almost exactly with the percentage in the population of chronics in all the general and special hospitals. At the City Hospital, where 72 aged chronics were found, 34 had fractures; 7 diseases of the prostate; 4 had heart disease; and the remainder were scattering.

In a special analysis of 500 chronic patients residing outside of Boston, but treated in Boston hospitals, 23.4 per cent. (113 patients) were 60 years of age or over. Fifty-one of these were suffering from cancer or other malignant tumors; 13 had arthritis; 14 had heart disease; and 14 had other diseases of the circulatory system. The remainder suffered from a variety of 10 other diseases.

The incidence of chronic ailments among the aged is revealed from still another angle in this study. The Community Health Association, among its 1016 chronically sick patients had 42.3 per cent. (430 patients) who were 60 years of age or over. Of the whole number, 72.2 per per cent. were bed patients.

Contrary to natural expectation, the 18 homes for the aged, with a total inmate population of 1055 at the time of this study, showed only 102, or 10 per cent., who were chronically ill. Homes for the aged, as a rule, receive no chronic invalids. Old people accepted for care must be able to get about; must be tractable enough to fit into the institution family without too much jarring; and must have some money or property to contribute toward their support. Most homes require also that the applicant must have been a resident for a specified number of years (usually 10) in the locality of the home, imme-

diately prior to admittance. These heavy limitations, imposed for the most part by the provisions of testamentary trusts, prevent the Home for the Aged from becoming the infirmary which is needed for the care of the aged who are sick, —chronically ill, it may be,—and are at the end of their resources. A ratio of 1 hospital bed to every 3 beds provided for domiciliary care is accepted as a fair minimum of infirmary provision in the institutional care of the aged today.

Public almshouses in Massachusetts have not been so hampered with restrictions, and since they are flanked on the one side by the necessity of receiving all who are legally sent to them and on the other by a constantly growing process of classification which removes all but the aged and infirm, these institutions are rapidly becoming infirmaries in the true sense. In Boston the almshouse is half of a single institution the other half of which is a fully equipped hospital. Public dependents therefore, find appropriate facilities for their care here no matter what the state of their health. Upon coming to Long Island for the first time they are placed in the hospital department for examination. If able they are then transferred to the almshouse department for residence. If at any time during such residence they become so infirm as to need hospital care, they are re-transferred to the hospital department to remain during the continuance of the indisposition. Such facilities are highly advantageous to almshouse care.

There are some 33,000 persons living in Boston, who are 65 years of age or over. Among them, as indicated by this study, are many who suffer from chronic disease. In the hospital population of patients who are chronically ill, they total less than a fourth. But among all the 4316 cases discovered in this survey, 41.6 per cent. (1795 patients) were 60 years of age or over.

One hundred and fifty-five of these aged chronics were found among the 626 chronic patients listed in the general and special hospitals; 93 were in the general hospitals; 430 were in the care of the Community Health Association. Thus 248 aged chronics were receiving care and treatment in hospitals, 102 were in homes for the aged, while 1445 were out in the community, either in their own homes, with or without nursing care, or in nursing or boarding homes, or in lodging houses. The 155 who were cared for in hospitals for chronic disease represented 8.6 per cent. of the group. The general hospitals had 5.2 per cent.; the homes for the aged 5.7 per cent. and the Community Health Association with its thoroughgoing nursing service, coördinated with dispensary clinics, 23.9 per cent.

The greatest and most constant need of the aged chronic sick reported by the case work agencies is for hospitalization at a rate within the means of the patient or his friends. With the cost of hospital care for acute illnesses standing at between $5 and $6 per patient day, it is difficult for an overcrowded institution, not designed for the care of chronics, or for the hospitals for chronics themselves, to face the press of appropriate cases and receive for care patients who can muster but $10 per week or less. It is this situation that provides opportunity for the boarding or so called nursing home without standards of care, to come forward and bid for the little that the patient can afford to pay.

LETTERS FROM PHYSICIANS AND CLERGYMEN

In our approach to the problem of the chronic sick we have availed ourselves not only of the records from hospitals and other institutions and agencies caring for such patients, but we have sought also such information and opinion as could be obtained from those physicians and clergymen who come in constant contact with the chronic sick.

The replies are omitted from this report in order to save space. Persons interested will find on file with the committee several hundred statements, the general purport of which is that doctors and clergymen meet constant difficulty in obtaining admittance for the chronic sick to hospitals and other institutions under the conditions suitable for the patient and at the price which he and his relatives can afford to pay.

OTHER INSTITUTIONS AND AGENCIES IN AND OUT OF BOSTON

Though it was not practicable in a survey of this kind, so limited in time, to include every possible resource of the care of the chronic and the incurable sick, it is of service to refer to some of the institutions and agencies both inside and outside the city, that come in contact, in one way or another, with the Boston problem.

Lakeville State Sanatorium. This institution, by a statute of 1924 (Chapter 508) is empowered to receive patients suffering from tuberculosis of the bones and joints. These may be resident anywhere in the Commonwealth. On November 1, 1927 there were 59 such cases at the Sanatorium, 19 of which were boys and 13 were girls.

Pondville State Hospital. This institution cares for cancer patients exclusively, receiving them from all parts of the State. It was opened in June, 1927. On December 27, 1927 there were 51 patients in residence, 14 of them from Boston. This hospital charged $10.50 per week to the patient when able to pay, and $17.50 to cities and towns where patients are public charges. Neither amount meets the per capita cost.

Massachusetts Hospital School. This hospital school for crippled children admits only orthopedic cases, but receives from all parts of the Commonwealth. It provides hospital care and educational training.

The Massachusetts State Infirmary. The cases from this institution, who reside in Boston, are

included in our survey data; totals from the other institutions mentioned in this section are not.

The Children's Sunlight Hospital at Scituate receives children from Boston as from other parts of the State; provides care and sun treatment during the summer months for children who are chronically sick. Most of its patients come from Boston.

The Children's Island Sanitarium, at Marblehead accepts from Boston as well as other parts of the State, children suffering with tuberculosis of the bones and joints and other orthopedic conditions. It is open during the summer months.

The almshouse side of the Boston City Institution at Long Island, is not specifically included in this survey, though it is operated in the same plant with the Long Island Hospital. On November 7, 1927 there were in the Almshouse wards of this institution on the census day, 452 chronic sick patients. This total did not include the old and infirm who were not ill with chronic disease. On the other hand it did include chronic alcoholics. These patients did not represent a separate unclassified group of the chronic sick, since many of them were back and forth between the almshouse and the hospital during the period of our study.

Child Care Agencies. The Children's Friend Society, and the Children's Mission to Children, both Boston child placing agencies, receive chronic sick children, especially heart cases, which they place in foster homes under special nursing care. Numbers are not large, but the relief given through helpful co-öperation with hospital social service departments is considerable.

St. Monica's Home. Twenty chronic and incurable sick patients, mostly from Boston, are cared for by this Home. These are all colored women and children. During summer the maximum capacity is increased to 22. Though the Home does care for children, the demand is so great for adult chronics that there are few children in residence.

HOSPITALS IN BOSTON FOR THE CARE OF THE CHRONIC SICK

At the time of taking record data at the several hospitals for the chronic sick, the survey director gathered by conference with the superintendents, certain information concerning policies, normal capacity of plant, and the type of service rendered. These hospitals are seven in number. They present a combined normal capacity of 953 beds which have for a long period been continuously filled.

Boston Home for Incurables

This is a high standard nursing home for the incurably sick. Though men have been cared for here in the past, only women and children are now admitted. All diseases except cancer, epilepsy and psychoses are admitted. There are 39 beds, namely 29 for women and 10 for girls. In emergency one extra bed can be added.

The superintendent has had social work experience. On the staff are a graduate nurse; nine attendants and a male orderly. A medical staff serves the patients on call and visits usually once a week.

Charges when less than the regular amount are based upon the patient's ability to pay, varying from $1.00 to $10.00 a month. The majority of the patients are cared for free.

Applications for the admission of adults are submitted to a committee of three members of the Board, who have full authority to act. Applicants are not accepted in the order of application, but are selected with a view to their need, and their adaptability to the group in the Home. Residents of Dorchester or the suburbs of Boston are given preference to residents of places farther away. A member of the committee visits each applicant before she is admitted and a physician passes upon her physical condition.

Visitors are allowed every second Sunday. Patients are seldom discharged from this institution. The exceptions are cases in which the patient has become too intractable to remain with the group or where relatives have been found who can provide support and other plans.

A new home is in process of construction, which will provide 45 beds for women and 15 for girls. The present building is to be used for nurses, attendants and others of the staff.

Holy Ghost Hospital

This hospital, under the supervision of a Roman Catholic order of nurses with a non-sectarian board of directors, is a hospital for incurable patients of both sexes. It receives all incurable conditions except mental illness. No discrimination is made in race, color or creed.

The Sister in charge is a graduate nurse, and is assisted by a staff of 20 visitors, most of whom are graduate nurses. In addition there are 15 attendants and 9 male orderlies assisting in the wards. A training school for practical nurses has been added recently. There is a staff of 12 visiting doctors, each of whom visits the home daily for a month, in rotation.

Bed capacity has been increased recently by the addition of a new wing. The capacity now is 210 beds; of which 85 are for men and 125 are for women.

Ward charges are $30 a week. Patients who cannot pay so much are charged in accordance with their ability to pay. There are 16 free beds in the wards.

The superintendent admits patients upon an application signed by a physician. Occasionally a patient leaves because he is lonely or through a desire of his family to have him at home. But for the most part patients remain here till they die. The patients are too ill or too disabled to profit by usual methods in occupational therapy. But much is done for their comfort and happiness. Books, musical instru-

ments and games are bountifully provided. Relatives and friends are permitted to visit daily.

House of the Good Samaritan

This is a hospital established for the sick poor. It accepts white cancer patients beyond the helpable stage, and heart patients, white boys, women and girls with hopeful prognoses.

The staff consists of a superintendent, a resident nurse, 3 graduate nurses, 5 attendants, a resident physician and a visiting staff of doctors.

Of the 75 beds, 21 are for women cancer patients; 13 for women and girls with heart disease 12 years of age and over; and 41 for boys and girls under 12. The cancer patients occupy single rooms on the top floor entirely apart from the children and in a part of the hospital not open to them.

Applications for admission are made by physicians, nurses, social workers and others, with the recommendation of a physician in the case of the last. Social facts pertaining to patients submitted by the social workers are accepted, and on the strength of these, Boston patients are admitted free when requested. Charges for care vary from 25 cents to $10 a week, the latter being the highest amount charged. Part pay is any amount less than this maximum that the patient is able to pay. The number of free patients from Boston is not limited. Each case is considered on its merits.

All admissions are made by the superintendent; all discharges by the doctor. Cancer patients are permitted to remain till they die. Heart cases are discharged as they improve or their condition ceases to be helpable. The visiting physicians attend regularly and are responsible for the medical care of the patients.

Children receive regular school instruction for 4 hours a day, from a teacher sent by the State Department of Education. Books, games and toys are provided, and thoughtful provision made for the welfare and happiness of these little folk.

No follow-up of discharged patients is provided, but the patient is always referred back to the physician or medical social worker who was responsible for the application in the beginning.

Long Island Hospital

This institution is the hospital department of the City almshouse supported by public taxation. It was established to serve as a hospital ward for the dependents in the almshouse. As the need for care of the chronic sick who are dependent in whole or in part upon the public has grown the hospital department has extended to its present large dimensions.

It is administered by the superintendent of the almshouse and hospital who is responsible to the Institutions Commissioner. Under the superintendent is a resident physician who is responsible for the medical care of the patients. He has 3 assistant resident physicians, 6 internes and a resident pathologist. Orderlies, varying in number according to the need, assist on the wards.

A visiting staff consists of specialists in different lines of medicine. These volunteers attend when called by the resident physician, and serve in a consultant capacity upon request. In addition regular visits are made by members of this staff.

The present resident physician is a graduate of Harvard Medical School and an instructor there. The assistants are graduates of various medical schools and are young men with some years of experience. The internes are more recent graduates of medical schools, one of them, a woman, a graduate of Oxford. The resident pathologist, a woman, is a graduate of Johns Hopkins Medical School and in addition has studied at Munich and in Denmark.

The hospital maintains a training school for nurses, offering a 3-year course which includes 9 months at the Boston City Hospital. The nursing staff is made up of a superintendent, an assistant, 5 teaching supervisors, an operating room nurse, all graduates, and 27 registered graduate nurses and 55 pupil nurses. In addition to the school for nurses, 40 attendants are trained at this institution.

The excellence of the hospital equipment is attested by an "A" grading by the American Medical Association and the American College of Physicians and Surgeons.

This hospital is part of the almshouse which is provided for the destitute of the city, though residents who can pay in whole or in part are admitted. During the last available reporting year, six such patients were received and given care. From this small proportion it may be assumed therefore that this institution serves Boston residents who are unable to pay for their care elsewhere. All applications pass through the office of the Institution's Registrar, where the decision as to admissibility is made. Mental patients, if found committable to a state institution, are not admitted to Long Island. Except for these and the further exceptions of contagious diseases and pulmonary tuberculosis, all kinds of chronic conditions are accepted, calling for medical, surgical or nursing care. Maternity cases, chiefly unmarried women suffering from syphilis or gonorrhea are accepted.

All persons admitted to the Almshouse are sent to the receiving ward of the hospital for physical examination. If the findings disclose the need of hospitalization the new arrival remains in the hospital as a patient. If he is fit to remain in the almshouse ward with or without the service of the dispensary in the almshouse department, he is sent there. If at any time he ceases to need hospital care he is sent to the Almshouse side. If, as an inmate of the Almshouse he develops a condition needing more medical or surgical and nursing care than can be given him

there, he is transferred to the hospital. This arrangement places immediate hospital attention at the disposal of each patient and makes it practicable to discontinue that relatively expensive service at the first moment the patient is able to go back to the Almshouse side. But because the inmates of both almshouse and hospital are public dependents, the period of stay in the hospital of all incurable cases is long, usually until death. Exceptions exist among the children who are discharged to the children's division of the department when ready to leave the hospital. A large out-patient clinic is conducted on the almshouse side.

The cost of hospital care per patient day is $2.05, slightly over one third of the cost at the Robert Brigham and the Palmer Memorial hospitals. One reason for this low per capita cost is the large amount of service rendered by partially able bodied inmates of the almshouse side and by prisoners from Deer Island House of Correction. Much of the manual labor in and about the hospital is performed by the almshouse inmates, some 75 of whom are constantly so employed. The outdoor duties, of which there are many, are performed largely by prisoners. No item for their services is charged off on the books, thus reducing the totals for administration to a minimum.

This hospital labors under three important handicaps as a hospital service to the chronic sick of Boston. First, its remoteness from the center of the city makes the attendance of consultants and experts in medicine and surgery difficult. Though the Island is but four miles from Eastern Avenue Wharf, a 30 minute run by steamer, the visitor must go when the boat goes, and must make his way well across the city to an inaccessible wharf. One trip to the institution takes a half day. In very bad weather it may mean more, though the discontinuance of the boat service is rare, even in the heaviest weather. These difficulties are inherent in the fact that this is an island institution.

A second disability arises from the need of serving the chronic sick who can pay a little and who have so great a prejudice against going into an almshouse as to impair their peace of mind as patients. The hospital is inescapably a part of the almshouse, and as such must throw that atmosphere about the patient. Though the distinction may exist in the mind of the patient rather than in reality, the fact that the patient is rendered unhappy and lonesome is very real. Social agencies dealing with the dependent sick find them averse to going to Long Island. Some refuse under any circumstances.

A third handicap arises from the overcrowding. The normal bed capacity of the hospital department is 325, of which 150 are for men and boys over 12; 100 for women (22 for maternity cases); and 75 for children. The average daily population so far exceeds these facilities that cots have been placed in sun parlors and other available space. This condition hampers the staff and renders sound medical classification and distribution of patients difficult to maintain. At the time of inspection, August, 1927, there were 476 patients present.

This condition is soon to be relieved by the erection of an addition to the men's ward of the almshouse and a children's hospital to provide 125 beds. A total appropriation of $1,000,000 is available for these extensions.

Three points at which this institution is subject to adverse criticism are all capable of remedy without the extreme difficulties that attend the foregoing. These are, first, the inadequacy of social service follow-up for patients going back into the community. The beginning already made should be extended.

Second, the infrequency of visits. A previous rule against visiting on Sunday is now suspended, and every person reporting inability to visit on weekdays is given a Sunday pass. Transportation facilities are limited to the smaller boat on that day.

Third, there is need of more occupational therapy than the superintendent has thus far been allowed. Much can be done for the comfort and contentment of this large group of dependents, bound to be forlorn at best, by the expedient of interesting occupations suited to their individual capacities.

New England Peabody Home

This institution receives Boston patients. It is located on a 40 acre tract about 5 miles from Boston and two miles from trolley transportation. It provides care, treatment and schooling for crippled children who are dependent. It admits patients who are crippled through tuberculous bones and joints; by infantile paralysis, and by fractures. Boys and girls up to 13 years of age are admitted.

The Home is in charge of a superintendent, a graduate nurse, under a non-sectarian board. There are three assistants. A school for attendants is maintained. A resident physician has charge of the children. There are also a visiting staff of physicians and a dentist. The plant is in effect a country branch hospital, where operations are performed and medical care given.

The normal bed capacity is 75; but by the use of cots on the porches this has been increased to a maximum of 115.

Patients able to pay in part are asked to do so, the amount varying from 25 cents to $10 a week, according to circumstances. The large majority of patients come from poor families.

Eligibility for admittance is decided by the superintendent and a committee of the Board. In addition applications must be submitted in writing; and each patient is examined by an orthopedic surgeon and an internist before he is accepted. Social facts reported by social agencies on applications are not accepted as final, and a separate investigation and visit to the can-

didate's home is made by the superintendent or one of her assistants. Parents are required to sign an agreement expressing their assent to a residence of the child for 2 years in the home, though exceptions are made in the enforcement of this requirement. Patients are kept beyond the age of 13 where physical condition demands it; but it is not the intention of the Home to retain any beyond that age where it is feasible to discharge them. All discharges are made upon the recommendation of the resident physician.

Visits are allowed once a month, on Sunday, when parents spend the day with their child if they so desire.

Educational work equivalent to that in the grade schools of Newton is carried on in the school department of the Home by 7 teachers. Special teachers give instruction in manual training, cooking, basketry, sewing, art and music. In this manner vocational work is made a part of the child's training. Some volunteer bedside teaching has been provided by the Newton Center Woman's Club.

Books, toys and games for indoor and outdoor recreation are amply provided. In the summer months excursions to festivities away from the Home add greatly to the pleasures of the children.

Palmer Memorial Hospital

Palmer Memorial Hospital is one of the seven organizations of the New England Deaconess Association partially supported by the latter and responsible to it through representation on its Board of Managers. It is a chronic private hospital for the care of cancer cases and allied diseases. No discrimination of race or color is made. The plant is new, and only recently occupied.

The Superintendent, a lay woman and a deaconess, is in charge of the hospital. The rest of the staff, all graduate nurses, includes an assistant superintendent, a nurse, supervisor of nurses, operating room nurse, a superintendent on each floor, a night superintendent and a superintendent of the Out Patient Department, a recent development. In addition there are student nurses and attendants. It also maintains a training school for nurses. There is a staff of visiting doctors who are responsible for the medical care of the patients, a staff of consultants and an associate staff of doctors.

The bed capacity is seventy-five; sixty-five for cancer patients,—twenty-three for terminal care, —and ten for other allied diseases. Both men and women are admitted. The exact number of beds for men and women were not decided upon at the time of the visit as the hospital had only recently opened and was not in full working order.

Admissions are made by the Superintendent and the medical staff. Each case is considered individually, both from the medical and financial aspects.

Charges vary from $3.50 a day for ward care to $10.00 a day for private rooms. There are three beds for free patients; 12 beds for part pay patients; reduced rates are made for individual patients as the necessity demands, the Superintendent making the decision in such matters. The average per capita cost per day for patients is $5.70 the first 6 weeks (1927, $4.40 per day); the latter 6 weeks $6.10 per day.

At the time of the visit no policy of discharging patients had been developed. Patients are usually discharged at the suggestion of the doctor, dependent upon the physical condition, and provided home conditions are suitable.

Patients are under the care of a resident physician, a graduate of a medical school and an interne, a fourth year medical student. The visiting medical staff visit their private patients daily, and the regular house patients once a week.

There is no social worker on the staff of the hospital and the follow-up work, a very recent development, is being undertaken by the Out Patient Department. Here patients are recommended to come after their discharge from the hospital.

The hospital itself is a beautiful modern building perfectly equipped for the patients' welfare and comfort with every medical and surgical facility. There are sun parlors, smoking rooms, library, games, victrolas and further conveniences.

Robert Breck Brigham Hospital

This hospital was created "for the care and support and medical and surgical treatment of those citizens of Boston who are without necessary means of support and are incapable of obtaining a comfortable livelihood by reason of chronic or incurable disease or permanent physical disability".[1] It is governed by a board of trustees which appoints the superintendent, the medical staff and all necessary committees. The medical staff functions under a physician in chief who gives half time to the work of the hospital and has visitorial duties. A staff of consultants represents special lines of medicine. There is also a courtesy staff for the private wards. Medical staff for the free and part pay wards consists of the physician-in-chief, his assistant, the general surgeons, the orthopedic surgeons, laboratory directors and one dental surgeon. The superintendent, a registered nurse, has charge of the administrative work of the hospital. Regular monthly medical conferences are held for the review of cases.

The nursing staff consists of the superintendent, who is instructor of nurses; a number of supervisors; a head nurse for each ward and several nurses doing floor duty in each ward. Nursing attendants and orderlies assist.

The hospital conducts a school for nursing attendants giving a 13 months' course.

[1] For the legal interpretation of these provisions see Dillaway v. Burton, 256 *Mass.* 568. (June 30, 1926.)

Patients must be Boston citizens without the necessary means of support. An admitting committee consisting of doctors and the superintendent passes upon all applications to the free wards. Each applicant is examined medically by the doctors and a social examination is made by the social service department.

Practically all chronic diseases, other than contagious and mental, are admitted. It is to be noticed in the tabulations, however, that arthritics predominate in the present patient group. Incurable cases represent a third of the total number admitted. This proportion is purposely maintained. Rehabilitated cases remain here on the average from 12 to 14 months.

The normal bed capacity is 115; of which 40 are in the private wards. Of the remaining 75, thirty-seven are for men and 38 for women. Twelve of the total are, however, reserved for children of school age.

The present cost per patient day is $5.70 in the free ward. In the private wards $4.70. (The raw food cost per capita is 54½ cents). This difference arises from the fact that included in the expense of the free wards is the cost of the social service department and the departments of occupational therapy and physio-therapy. Full pay charges run from $30 to $35 per week; part pay, from $2 to $7 per week.

The hospital maintains a department of home service, established to meet the recognized needs of patients in the free ward. This service provides both medical and social "follow-up" after discharge. Patients after leaving the hospital, report at stated intervals regulated by the physician in charge. Weekly clinics are held in this department. If a discharged patient, as occasionally happens, is found to need hospital care, he is readmitted. A few patients who have never been admitted are carried by this department. The records of the work form a check-up on the results of the treatment given in the hospital. The Community Health Association co-öperates in providing nursing care for these home patients. Altogether the number of patients in the care of the Home Service department exceeds those in the hospital, and is constantly increasing.

Practically every ward patient has occupational therapy prescribed for him. With the emphasis upon therapeutic values, this helps in the restoration of joint muscles, etc. The Boston School of Physical Education sends pupils to this hospital for a course in the physio-therapy department. Through the social service department, affiliation has been made with Simmons College, by which students come to receive social service training; and with Harvard University and Wellesley College to secure student volunteers to read to patients.

A full time Boston school teacher assigned by the Boston School Committee and paid by the city teaches classes in the school room and gives some bedside instruction. A well equipped library under the care of the Junior League volunteers supplies reading material to the bedside; and a variety of entertaining diversions, including a glee club, help to lighten the hours.

Patients may have visitors each day from 2 to 3 P. M., and from 7 to 8 P. M.

SUMMARY AND DISCUSSION OF FINDINGS

At the outset of this study the Boston Council of Social Agencies outlined the following eight specific questions which it hoped the survey would answer:

1. Is there need for further institutional care?
2. If so, for what medical types and what economic groups?
3. If institutional care is needed, should it be hospital or custodial?
4. Do we need more nursing homes, and does the situation demand that they be licensed?
5. Do we need more home care?
6. If so for what types of cases?
7. Should such extension be trained nursing service, or attendant nursing under supervision?
8. If an extension of hospital or of home care is indicated, what proportion should be public and what private?

The survey discovered 4,316 persons chronically ill i.e. a ratio of 1 to each 185 of the population of the city proper. These were known to hospitals for chronic diseases; to social service departments of general hospitals; to the Community Health nurses; and to case work agencies. All ages and both sexes were represented. Males totaled 46.2%; females 53.8%. Seventeen and seven-tenths per cent. were under 15 years of age; 7.3% between 15 and 29; 33.6% between 30 and 59; and 41.6% were 60 or over.

As to the cause of illness, one-fifth of the whole number were diagnosed as heart disease. Cancer was the second great disabling cause. Then came such important diseases as arthritis, tuberculous bones and joints, and fractures.

A separate analysis of 500 among the 808 non-resident chronics discovered in the total showed cancer to be the greatest single cause, with 121 victims. Heart disease came next, with 98; non-pulmonary tuberculosis 84.

Of all the 4,316 patients 2,340 were classed as ambulatory. Among these were many who were up and down, bed patients at one time and able to be up and about at another. Among the 1,016 patients known to the Community Health Association, 72.2% were bed patients. This percentage is to be compared with 67.3% among the 1,043 cases rendered by the social service departments of general and special hospitals; with 22.6% in the 394 clients of social agencies; and with 55.7% just noted for the group as a whole. A causal factor in the high ratio of bed cases in the home care group is the

fact that 42.3% of the 1,016 were 60 years of age or over.

An analysis of the disposition made of the 4,316 patients in the study shows that 18.2% were still in hospitals; 18.8% were under the care of the reporting agency, outside of hospital; 10.8% had died; and 46.8% had been discharged in various ways as set out in Table II. The whereabouts of 5.4% were unknown. Of the aggregate, 1,863 were in hospitals for chronic diseases, and of these 1,103 were public dependents; 890 of them at the almshouse hospital at Long Island and 213 at the State Infirmary at Tewksbury. A single group, 1,016 in number were in their own homes or in lodging houses under the care of the Community Health nurses.

The eighteen general and special hospitals, in their census of 707 chronic patients, reported that 155 had been in residence 3 months or more and 552 were stated to need care for more than 3 months. The schedules returned for 626 of these patients revealed 92 chronic heart; 71 cancer, 57 fractures and 46 infantile paralysis, as the larger single groups. The medical recommendation for disposition of the 626 was that 193 go to hospitals for acute cases; that 222 be sent to hospitals for chronic diseases, that 101 be given care in their own homes under the supervision of the district nurse; that 26 go to boarding homes.

Further light was thrown upon the problem as it comes to the general hospitals, by a study of a twelve-months period of admissions to the Boston City and the Massachusetts General hospitals recording all patients who remained 12 weeks or more. At the City Hospital there were 292 of these. Of this group 181 were males. More than half of the 292 were cared for on the average from 12 to 19 weeks. One hundred and six of the 292 were fracture patients. The Massachusetts General Hospital had 85 such patients. They were cared for an average of 19 weeks. Twenty-three were fracture patients.

Still other evidence of the magnitude of the problem appears in the 491 chronically sick persons reported by social agencies and Community Health nurses as needing medical and nursing care away from their homes, probably in a hospital for the chronic sick or in a properly supervised nursing home.

Finally there were the 270 applicants with a three-months period, for admission to the hospitals for the chronic sick, of which number 186 were admitted. Of the 84 who were refused, 15 were turned away for lack of room or because the hospital to which they applied was not equipped to give the medical care which they required.

Here then is a large number of chronically sick persons—undoubtedly much larger in fact, if there could have been included information as to the chronic sick under private care of physicians and surgeons. The diagnoses show, for most of the group, the need of prolonged care either at home under careful medical attention and sound nursing supervision, or in hospitals for the chronic sick under skilled medical and nursing care.

The study found a total capacity of 953 in the seven hospitals for chronic diseases. These institutions have not sufficient facilities for carrying the whole load. It is to be noted that a third of the entire bed capacity is at Long Island. In point of fact practically half of all the 1,863 patients reported from these seven hospitals in the period covered were cared for at Long Island. Leaving out the 325 beds at that institution, there are but 628 beds in the city for chronic patients, and practically all are filled all the time. As these patients require relatively long-time care—at least one fourth of them for more than a year—the ratio of beds to the number in need must be many times higher than that of a hospital for acute cases, where the average stay is about two weeks. Of the 626 chronic sick reported from the general and special hospitals on the census day, 17.3% or 108 were declared by the physicians in charge to need further care in a hospital for the chronic sick. But if such disposition had been actually sought there would have been no room, and, the overload at Long Island would have been 61% instead of 46% as it is now.

In addition to limited facilities, in view of the need, which is for long-time care at little if anything above a free basis, the various hospitals have limitations that bar many patients. Thus an applicant must be, at present, a relatively high-pay patient to go to Palmer Memorial. The Boston Home for Incurables does not take men, and cancer is excluded. The House of the Good Samaritan takes hopeful heart cases, and cancer only. Males over 12 are excluded. Channing Home, a hospital for chronic diseases, established for the purpose of "providing an asylum for poor invalids" is restricted by the policy of its board of management to the care of women, and these only who are suffering from pulmonary tuberculosis. It is because of this latter fact that this institution has been omitted from this survey. At the Robert B. Brigham Hospital, 40 of the 115 beds are in private wards and these are therefore not accessible to the chronic who can pay only part or none of the cost.

Some limitations there must be, in order to provide appropriate service to the various natural groupings, according to age, sex and diagnosis; but as there exists no coherent plan by which the greatest need is ascertained and met by the largest number of beds, these limitations further cramp the facilities now existing for adequate hospitalization of the chronic sick.

The evidence points fairly to a major need for hospitalization for the chronic sick that is as yet unmet. The diagnoses disclose large single groups like heart disease, cancer, non-pul-

monary tuberculosis and arthritis, which call for prolonged care under careful medical attention and skilled nursing supervision. Obviously much of it can be given only in a hospital. Because of the high percentage of victims in the early and middle years, the need for physical rehabilitation and special education is readily apparent. Beyond a doubt the answer of this survey to the Council's first query is "Yes".

But if we do find a need for further institutional care, how shall we answer the second query, namely, for what medical types and economic groups should this care be provided? Data on the length of stay of patients in the several institutions, showed relatively long periods in the hospitals for chronics and much shorter periods in the general and special hospitals treating acute cases. Nevertheless, of the 3,127 patients of all kinds occupying beds in the 18 general and special hospitals on the census day, 4.9% had been occupying, for more than 3 months, beds designed and maintained for acute cases. Furthermore 17.6% of the entire census list of patients were declared by the medical staff to need further care in a hospital for chronics, or elsewhere, which would continue, at least, for more than 3 months. Boston hospitals caring for acute diseases, the Boston City Hospital in particular, are under heavy and constant pressure to terminate the care of all patients who have passed the acute stage of illness sufficiently to be removed.

The age groupings of the 4,316 patients shows 17.7% under 15 years of age. Chronic heart disease, infantile paralysis, fractures and tuberculous bones and joints contributed largely to this numerous company of handicapped youth. Each one of these children has his future ahead of him. If there is hope of turning any of the chronic sick from liabilities into assets it lies mostly in this group of the young. But if anything of importance is to be accomplished it must be done by constructive measures. Not only must these children have careful medical and nursing attention, but they must have education and training for some vocation in life least likely to yield to their handicap. For this group, then, there must be a material extension of the excellent but limited service now rendered by some of our hospitals and health agencies.

These children constitute a major problem in physical rehabilitation and in education to be carried out by means not available in the public schools. The problem requires more study than it has yet received.

Forty-one and four tenths per cent. of the whole number were 60 years of age or over. Industrially superannuated, the large majority of them economically dependent even without the fatal handicap of chronic illness, these elderly folk need the friendly helping hand of the community. But 17% of all the chronic sick cared for by the hospitals for chronic diseases were reported as full pay patients and only 15.8% were paying in part for the cost of their care; thus leaving 67.2% who did in fact make no contribution to defray the cost of their care.

The problem represented by these aged chronics becomes greater as population increases and more and more people—thanks to scientific medicine and sanitation—are surviving to enter this age group. In fact it is a problem intimately connected with the care of the aged—so much so that the pressure upon homes for the aged to provide care for the infirm, just as the public homes for the aged have done, is heavy and constantly increasing. The service which the Community Health Association is rendering in the home nursing of long-time cases of the aged infirm needs further extension. Not only should homes for the aged provide hospitalization for the aged infirm who cannot remain in their homes, but the example of the Home for Aged Men in home service should be followed and a large proportion of the activities of each institution transferred to those who at present stand on the waiting lists and have scant attention save from general relief agencies.

In the productive middle years fall 40.9% of our total. These are they who, for the most part, have had to stop earning because of continued illness. They must be pretty thoroughly rebuilt physically if they are to go back to the job. Somehow their economic burdens—yes, even their own weight—must be carried; and this long and costly process of care and treatment to regain health must be borne by somebody other than themselves. Many of them are obviously terminal, and can never get well; but many are capable of salvage, and it is likely that many who for lack of special care and sound treatment do rapidly become incurables, could be rehabilitated with the additional effort.

Though hospitalization is obviously necessary to sound medical care and treatment of the chronic sick, there is nothing in this study to indicate that it is the primary consideration. Indeed it is more than likely, in view of the large number of patients who find it practicable to remain at home under the care of a visiting nurse, going to the private physician or to a dispensary where able, that the true point of attack upon the problem of the chronic sick is not the hospital in the first instance but rather the family home. Wherever a patient has a home in which he can be made comfortable by his own kin, and where medical and nursing oversight can be supplied by the private practitioner and the visiting nurse, there is the place where he will enjoy the maximum of contentment under the trying conditions of his disease. It goes without saying that the place for the sick child is at home wherever practicable.

An analysis of the reasons given on the record of the patients who were cared for in the hospitals for chronic diseases and in the records held by social and health agencies for those who

were cared for at home alike point to the conclusion that the first consideration is the patient's home. Most of the patients who went to the hospitals did so either because they had no home or because the necessary medical and nursing attention could not be secured there. *Per contra* the greatest number of those who remained at home did so because the home was capable of providing the requisite care.

But granted the need of home care where practicable, the constant complaint of case-working agencies is that they cannot find hospitals or nursing homes of standard equipment and practice, other than Long Island, that will receive their chronic sick at the prices the patients or their relatives and friends can pay. Patients who have been ill a long time are not earning and have depleted their reserves of capital in most cases. A large number—41.6% in this study—are old and almost wholly dependent. Agencies like the Family Welfare Society, dealing with aged women; and the Home for Aged Men in its field service to aged men, find this problem of necessary hospital care nearly insurmountable.

The large percentage of patients in this study who paid nothing for their care (67.2%) in the hospitals for the chronic sick; and the additional 15.8% who paid only in part, shows what a large part of this problem relates to families of small means. At the same time the diagnoses show how over-whelming is the total of diseases like heart, cancer, tuberculous bones and joints and arthritis that require prolonged care and treatment by doctor and nurse.

It is plain from the data that the answer to the Council's second question must be that this hospitalization is needed not only for the patient who is completely dependent but also to a large extent for the long-time care and the rehabilitation and re-ëducation of the patient who is not absolutely destitute but who nevertheless can pay a very little for his care and treatment.

The third question,—should such care be hospital or custodial is as plainly answered by the same data. The provision should be on a hospital basis purely. The care of public dependents is already provided for to a large extent and will be amply so when present enlargements are completed on Long Island. In view of its location remote from the natural centre of activity in the city, and in the light of the long continued effort of its successive administrative officers through four decades, to keep its efficiency high, the survey committee is of the opinion that it was a mistake to place this institution on an island away from close contact with medical consultation and the central stream of the city's life. It has however been so placed, and now represents an investment said to be nearly $4,000,000. Until such time as the people of Boston find it economically advisable to transfer all its functions to the mainland, it should be maintained at the highest efficiency practicable with the means at hand. To do this requires more than efficiency and devotion in the management. It calls for intelligent and loyal backing by the public. Particular suggestions submitted by the Committee as a result of the Survey are (1) that better and more frequent transportation to and from the island be allowed; (2) that visiting be allowed more frequently and in particular on Sunday when friends and relatives may come without losing time at their several employments; (3) that the superintendent should be given a department of social service to study the social problems of the patients and to follow them back into the community in case of discharge; (4) that the request for an occupational therapist already made by the Commissioner be granted and that work extended in order to brighten the lives of the inmates and patients; (5) that friendly visiting to patients by a committee composed of men and women be set up for the purpose of upholding and furthering the efforts of the management to brighten the lives of the patients.

Although many of our local nursing homes are known to be of excellent quality, it may be stated in general that nursing homes not held to account by the public are in danger of running into abuses. The survey shows but 65 patients in such homes known to the entire group of authorities consulted. Yet there were 315 such homes known to the hospitals and agencies as desiring patients and as being, presumably, in the practice of taking them. The facts point to the presence, probably, of some hundreds of persons chronically ill, who are outside the data in this survey and who are unknown to hospitals, health or case working agencies. There is no means by which the public can be assured that the needy patients who go to them are given kindly and efficient care. That they have little to pay is in itself a warning that in many instances, without a careful public check, the service may be at least no better than the price. In the hospitals for the chronic sick the patient who affords $7 or $8 per week is paying for less than a fifth of the actual cost of his care. In the nursing home, though the cost is less than the hospital, such payment would still be greatly below the cost of efficient medical and nursing care.

At the same time that the temptation to inferior service is faced by nothing stronger than individual conscience, the constant inability of the community to provide adequate hospital care for those who have little and yet must be cared for away from their own homes, holds out a bait for householders to come forward and bid for the few dollars that the patient can pay, even though they may have neither the will nor the ability to furnish medical and nursing care of standard quality.

The survey shows clearly that many families able to provide the personal care with medical and nursing oversight from the outside, are nevertheless financially unable to meet the expense without becoming dependent. Many are

assisted by public relief through the Overseers of the Public Welfare in co-öperation with the Dispensaries or the Community Health Association. Many are cared for at home by the Community Health nurses in co-öperation with clinics and dispensaries. But this phase of the problem appears to be only partially covered. It should be extended. The answer to the fifth question, "Do we need more home care?" is, "yes."

The home nursing service provided by the Community Health Association should be extended. The type of case most in need of this care is the elderly patient whose condition is such that there is no necessity for keeping him for years in a hospital, and who has a family home where the provision of a nurse and a visiting doctor with the addition of some financial aid will make the patient comfortable and furnish him with skillful and effective medical and nursing care.

In view of the kind of case, for the most part the aged chronic, it seems practicable to furnish the necessary care through a corps of attendant nurses, under the direction of such a body as the Community Health Association. There is evidently a need for further consideration of this question since attendants for the sick are not registered nor is their training standardized. It is suggested that the Community Health Association, the Household Nursing Association, and those institutions offering training to attendant nurses consider the necessary content of training for nursing of the chronic sick in their homes.

Finally, the question how much of this burden of hospitalization and home care should be borne by the public out of taxes and how much by benevolent individuals in the community cannot be authoritatively settled by statistical data. It is certainly true that the problem of the chronic sick calls for more support than it now receives from the city. Much is being done for the public dependent. But for that large class of indigent but not destitute citizens, there is nothing but the acute wards of the City Hospital, already overcrowded with acute cases. The City should not ask these patients to enter the almshouse hospital for care as dependents. It does not ask the acute patients to do so. It provides medical and nursing care for them at the City Hospital at a rate which they can afford to pay. And if they can pay nothing it still gives the care. It is only when the condition becomes long drawn out and the patient is getting in the way of emergent cases, that he is sent to Long Island Hospital, or back into the community to find lodgment in a nursing home or a charitable hospital.

Further facilities for chronic patients should be provided by the city on the main-land. Such facilities should take the form of a unit sufficient to support and maintain a strong element of research analogous to that now carried on by the Thorndike Memorial at the Boston City Hospital, and through which chronic patients could be cleared for suitable care at home or elsewhere.

But it is not in accordance with the traditional benevolence of the people of Boston to thrust the burden of such long-time care of the sick wholly upon the city government. It seems reasonable and altogether practicable that wise extension of existing hospitals, with the upbuilding of more home care, would be sufficient to meet this problem provided the city furnish the facilities described above. The contemplated extension of 34 beds at the Robert B. Brigham; the new building of the Boston Home for Incurables adding 60 beds, already look toward some slight relief. The State Hospital at Pondville is helping somewhat with cancer. But further extensions such as these should be decided upon not separately by independent boards of managers, viewing only the internal problems of their own institutions; but rather after careful and continued consultation with the other units of the hospital group. Their problem rightly viewed is not divisible. As a great social problem of the city's life it must be considered as a whole. Such constant and constructive deliberation over problems and policies as the need demands can be had only through a permanent conference mechanism. In several cities in America this object is attained through a hospital council. There should be such a body in Boston.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 14321

PAIN, COUGH AND FOUL SPUTUM

MEDICAL DEPARTMENT

A married woman twenty-one years old entered March 5 complaining of pain in the right chest on coughing.

Five weeks before admission she had tonsillectomy performed under ether. Seven days later she began to have occasional sharp pain in the right chest with productive cough, occurring about every half hour, worse on breathing, waking her at night. The sputum was yellowish, not foul. She did not raise more than one or two tablespoonfuls at one attack of coughing, in all about two ounces a day. During the first week she remained up and about. The second week, ten days before admission, the pain became worse and she went to bed. Medicine given by her physician relieved the pain a little. She had remained in bed and found the pain somewhat relieved, especially when she lay on her back, but the sputum was four to six times the amount it had been and so very foul that it frequently caused her to vomit. It was now brownish and blood streaked and amounted to two cupfuls a day. For two weeks she had had profuse sweats at night starting with attacks of coughing. During the past week she had felt feverish.

The family history is negative.

She had been married a year. She had had two abortions done, one two years ago, another sixteen months ago, without complications. She was now five months pregnant. Her tonsils had been removed twice, the first time when she was seven. She had influenza ten years ago and pneumonia without complications six years ago. She had rather severe frontal and occipital headaches about once a month. During the past two months she had urinated twelve times by day and three to four times at night. During the past week she had had three nosebleeds, easily stopped. Three years before admission she weighed 130 pounds, her best weight; her usual weight was 118 to 121. She thought she had lost ten pounds in the past month.

Clinical examination showed a well developed and nourished, pale girl in no acute distress. Breath foul, especially when coughing and raising large amounts of foul blood tinged sputum. Throat injected. Breasts enlarged; increased pigmentation, with Montgomery's tubercles. Lungs clear in front. Expansion limited in the upper right back. In the right axilla dullness and slightly diminished breath sounds, voice sounds and tactile fremitus. Heart not remarkable. A blowing apical systolic murmur. Abdomen negative except for resistance in the midline above the symphysis; mass not outlined.

Amount of urine and specific gravity normal, a trace to a slight trace of albumin at all of three examinations, leukocytes at all of three sediment examinations, red cells at two. (No catheter specimen.) Renal function 40 per cent. Blood 18,300 to 11,800 leukocytes, polymorphonuclears 91 per cent., hemoglobin 70 to 65 per cent., reds 4,030,000 to 2,800,000, slight variation in size and shape, no achromia, platelets increased. Icteric index 2. Non-protein nitrogen 19 milligrams. Wassermann negative. Sputum brown, mucopurulent. No tubercle bacilli at three examinations. Fontana stain showed numerous spirochetes.

X-ray showed an area of dullness occupying the region of the right middle lobe. The borders were quite dense. There was a bright area in the central portion. No definite fluid level. Below this area in the lower lobe there was some fine mottling. The diaphragm was rather high on this side. The heart was not displaced. The left lung appeared normal. Both apices were clear.

Temperature usually above 102°, range 101.4° to 105°, rectal. Pulse 108 to 159, with a terminal increase to 180. Respirations 25 to 54.

The lung signs changed daily. March 7 there was dullness with coarse râles in the right lower back with an area of slight bronchial breathing and bronchial whisper just below the angle of the right scapula. The patient went rapidly downhill. An obstetrical consultant reported that mechanically pregnancy, although it was at too early a stage to do much good, should help the lung condition by limiting the excursion of the diaphragm. He advised disregarding the pregnancy in treatment. March 9 three grains of neoarsphenamin was given intravenously. The next day the temperature was higher and the pulse and respirations more rapid. At five in the morning she began to raise blood and by eight o'clock had raised about six ounces. She was then semicomatose and seemed *in extremis*. The right lung was filled with coarse râles. That afternoon she rallied remarkably, was less cyanotic, the temperature and pulse down. In the night she had some pain in the right axilla, pleural in character. The next morning the temperature and pulse were again increased. March 12 the dullness at the right base was up to the middle of the scapula, with slightly diminished bronchial breathing, increased voice, egophony and numerous râles. There were many coarse râles in front and a questionable rub in the axilla. Pneumothorax was advised by the Thoracic Clinic. It was felt, however,

that the danger outweighed the possible benefit. March 14 she died.

Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

Abscess of the lung comes to mind at once, and with the history of large amounts of very foul sputum we essentially have the diagnosis without going further. The other symptoms are characteristic of a condition about as destructive as anything we have in medicine.

The urinary frequency was probably due to concentrated and acid urine, irritating the bladder.

The history before the present illness adds nothing to what we had at the start—pain, cough and foul sputum.

NOTES ON THE PHYSICAL EXAMINATION

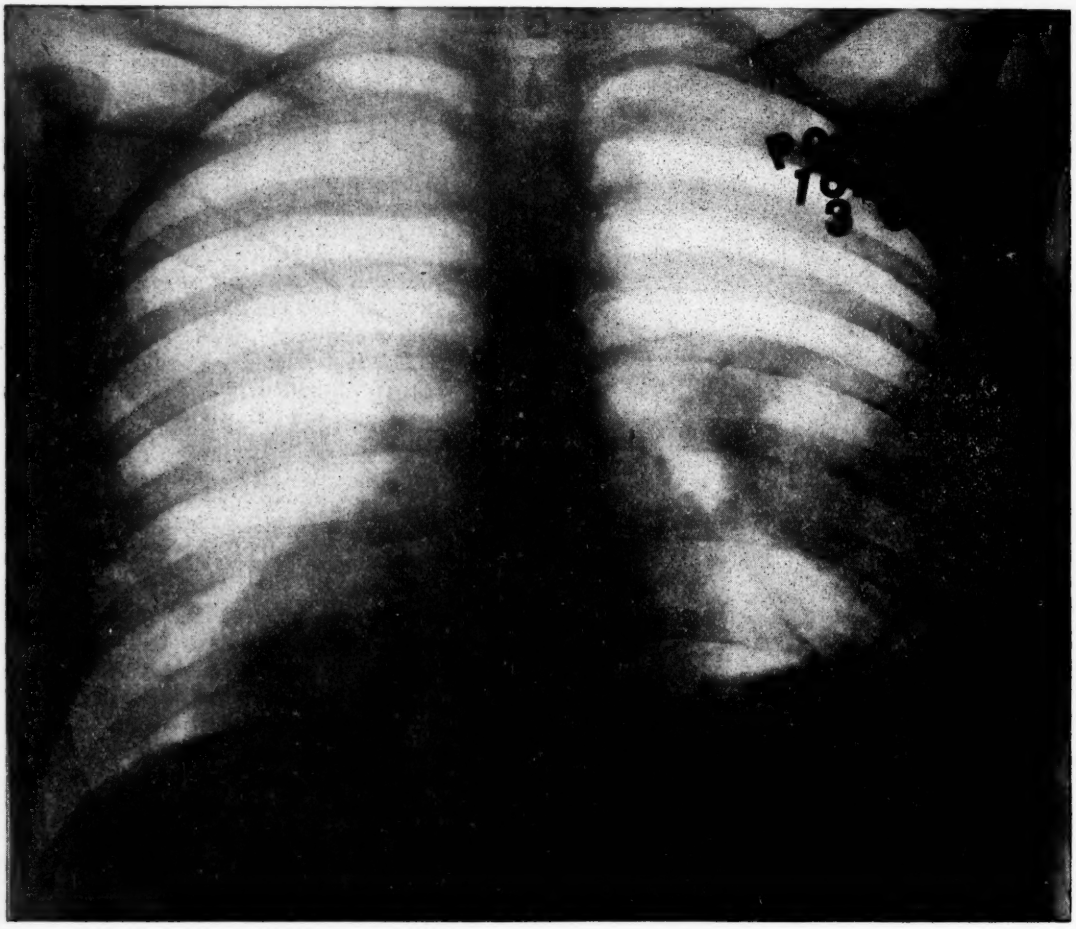
The lung signs are consistent with what we get around an abscess.

The abdominal mass was from the uterus, in view of the history.

There was no catheter specimen of urine; we have no reason therefore to suspect trouble in the kidneys. The urine and blood are all perfectly consistent with our first guess. The secondary anemia before the end was quite severe.

Of course it is a familiar fact that we usually get spirochetes in lung abscess. The finding has no special significance.

The X-ray is our essential data here. A fluid level if you get it is proof of a cavity. If you do not get it it may mean that the patient has recently expectorated the contents of the abscess cavity.



CASE 14321. Shows an area of dullness occupying the region of the right middle lobe. The borders are quite dense. There is a bright area in the central portion; no definite fluid level. Below this area in the lower lobe there is some fine mottling. The diaphragm is rather high on this side. The heart is not displaced. The left lung appears normal. Both apices are clear.

Neoarsphenamin was given on the general principle that if the spirocheta pallida is hit by it another may be; that it can do no harm and may do some good. It ordinarily does not.

"The next day she seemed *in extremis.*" That is a much pleasanter thing to have happen here in the hospital than in private practice. When something like that happens in a small town, the doctor is liable to lose half his practice. If people hear that a hemorrhage followed an intravenous injection, although presumably it had nothing to do with the medicine, they talk, and

it makes a very serious problem for the doctor. He may have nothing to blame himself for. Yet such coincidences may have terrible consequences.

Egophony is a nearly useless physical sign. It takes a good while to learn to hear it. When you do hear it you will be very much impressed. Then it is not much use. Just what it means or what you are to infer it is hard to say. I have no idea what it means, particularly here.

Pneumothorax was advised with the idea of collapsing the lung and so stopping hemorrhage and sepsis.

DIFFERENTIAL DIAGNOSIS

The diagnosis, lung abscess, is perfectly clear. The only question is, what complications or other facts are there? What remains? In the first place, undoubtedly pleural adhesions, and probably areas of bronchopneumonia and fibrosis outside the abscess. Whether there is any effusion at the right base I do not know. Patients with abscess not infrequently bleed. Ordinarily they do not bleed in quantities great enough to endanger life. Here hemorrhage was a serious factor. It is not usually so.

Abscess of the lung is a bad thing to have to treat. It sometimes can be successfully operated upon. It occasionally can be relieved by pneumothorax. No medication can touch it, and a great many cases die.

What about the rest of the body? I do not see that we have anything to make us suspicious of the other lung, of the heart, or of any disease in the other organs except cloudy swelling, which in sepsis we often find in all parenchymatous organs.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lung abscess of middle lobe.
Pregnancy.

DR. RICHARD C. CABOT'S DIAGNOSIS

Abscess of the right lung.
Pleural adhesions.
Areas of bronchopneumonia and fibrosis.
Cloudy swelling of the kidneys and other organs.

ANATOMIC DIAGNOSES

1. *Primary disease.*

   Abscess of the lung, right middle lobe.
   Bronchopneumonia.

2. *Secondary or terminal lesions.*

   Pregnancy.

3. *Historical landmarks.*

   Scar of tonsillectomy.

DR. TRACY B. MALLORY: A large lung abscess was present in the right middle lobe, as shown in the X-ray. The pneumothorax which was advised therapeutically three days before death actually occurred spontaneously a few minutes or hours before death. The abscess had perforated and the lung was partially collapsed. A considerable amount of air and pus was found in the pleural cavity. The pleura over the abscess was quite firmly adherent to the thoracic wall, so that it would have been impossible completely to collapse the lung with a pneumothorax. It was very lucky that they did not try it, as perforation might have occurred just at the time that they were doing the manipulation. The bacteriologic studies of the abscess showed an immense variety of organisms. A great many spirochetes and fusiform bacilli of the type usually found in Vincent's angina were present. There were also various types of cocci, especially streptococcus viridans, and a number of unidentified aerobic bacilli, the majority of them presumably saprophytic in character.

The case is of some interest for speculation as to the etiology in view of the recent paper presented here by Dr. Elliott C. Cutler. He feels very strongly that the vast majority of postoperative lung abscesses are embolic in origin, the result of small septic emboli producing minute septic infarcts which then go on to abscess formation. Those of you who heard his talk were undoubtedly impressed with his demonstration of the way typical lung abscesses can be produced by that method. I think the proof that that is the method by which lung abscesses actually do occur in human cases is still lacking. We do see some cases in which that undoubtedly is the mechanism, for instance the multiple and usually rapidly fatal pulmonary abscesses following thrombosis of the jugular vein with mastoid disease or of the pelvic veins in puerperal sepsis. Nevertheless chronic lung abscesses are very rare in those conditions, which are just the type that should lead frequently to lung abscess if that were the ordinary etiology. The majority occur following operations on the upper respiratory tract, and show on bacteriologic examination the same mixed flora of organisms which are found in the oral cavity. Even in the very minute abscesses which we sometimes pick up more or less by accident in cases dying within a week after such an operation there is a multiplicity of organisms which speaks to my mind against embolic origin. Organisms which work their way into veins and produce thrombi are usually only the very virulent ones. The blood is easily capable of killing off non-pathogenic organisms at a rapid rate, and yet lung abscesses as we see them almost invariably have a wide variety of bacteria, including many saprophytes. In this particular case we did a very careful section of the neck. The tonsils had been entirely removed. No macroscopic thrombi were found in either the internal or the external jugular veins or their larger branches. That would not rule out the possibility of minute thrombi which if

broken loose would be quite capable of producing small septic foci in the lung. Proof of Dr. Cutler's hypothesis still demands the demonstration of infectious thrombi which contain a multiplicity of organisms about the operative field.

DR. CABOT: How does Dr. Cutler account for the fact that there are so many more abscesses on the right side than on the left?

DR. MALLORY: He finds that that is true in his experimental animals also. The arrangement of the bronchial arteries tends to divert more emboli to the right than to the left. That is at least as good an explanation as the usual one of difference of the bronchi.

The other findings are essentially negative except for parenchymatous degeneration in the liver and kidneys and a pregnant uterus which in my estimation was not more than three and a half or four months.

DR. CABOT: There was no pneumonia?

DR. MALLORY: There was a diffuse bronchopneumonia in the other lung.

CASE 14322

SIX DAYS' EPIGASTRIC PAIN, VOMITING AND COUGH

MEDICAL DEPARTMENT

A married Italian woman forty-eight years old came to the Emergency Ward January 16.

Six days before admission she had onset of epigastric pain followed by vomiting. She continued to vomit frequently every day. Since the onset she had had cough, productive of sputum, green at first, later bloody. For a day before admission she had pain in the right side of the chest, worse on breathing. At admission she still had some abdominal pain, but generalized. She felt weak and ached all over. In the Emergency Ward she was obviously very weak, with a high temperature, with marked herpes of the lips and at the right base bronchial breathing and sticky râles with dullness.

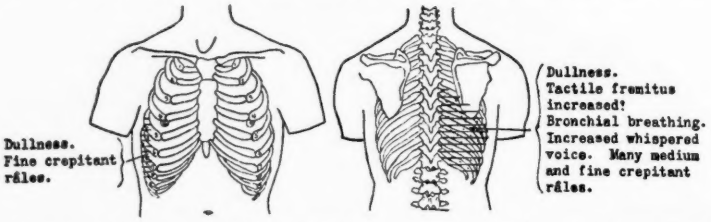
No other history was obtained.

Clinical examination was brief because of her condition. It showed an obese woman propped up in bed, quite ill, on the edge of delirium, with flushed face and cheeks, hot dry skin and increased respirations. There were many vesicular and crusted lesions of the lips, especially on the left. Tongue dull, red, raw and dry. Pharynx injected. Teeth somewhat carious. Moderate pyorrhea. Heart not enlarged, rapid, regular. Sounds at the apex distant. A rough systolic murmur over the precordia, best heard at the base of the heart and down the sternum, where it was close to the ear and had a rasping quality. The examination was not good because of the rapid rate and obesity. No diastolic murmur was heard. Pulses full, somewhat collapsing, not of high tension. No evidence of peripheral sclerosis. Blood pressure 115/68 to 135/90. Lung signs as shown in the diagram. Abdomen: Obese, tympanitic, no spasm. Generalized tenderness, not great in the right upper quadrant. No organs or masses felt. Pelvic and rectal examinations postponed. Pupils normal. Arm, knee and ankle jerks not elicited. No stiff neck.

Urine at admission very turbid, alkaline, specific gravity 1.014, a trace of albumin, guaiac strongly positive, 3 to 6 red blood corpuscles per high power field. Two later specimens cloudy, 1.014 to 1.016, a trace to a large trace of albumin at both, bile faintly to slightly positive at both, sediment of both showed leukocytes; one showed rare red cells and was loaded with brown granular or hyaline casts; numerous casts in the other. Blood: 29,700 to 20,100 leukocytes, hemoglobin 70 per cent., reds 4,720,000, polymorphonuclears 95 per cent., many young polymorphonuclears, red cells apparently normal, platelets reduced. Wassermann negative. Blood culture: (I) staphylococcus albus, probably contamination; (II) no growth. Sputum by mouse inoculation showed Type IV pneumococcus. Stools, guaiac negative.

Temperature 105.6° to 102.2°, rectal. P. 100 to 132. R. 18 to 40.

The night of January 19 the patient looked strong in spite of hyperpyrexia. There was grunting expiration and some cough with sputum. The right lower chest was dull, with distant breath sounds and with râles and prolonged expiration above this. The left base showed sticky râles. The pulses were fairly strong. Distention was very marked. The patient was incontinent. She was digitalized and given a quarter grain of morphia every four hours p.r.n. for restlessness. The temperature very gradually subsided. The pulse continued strong. January 21 the systolic blood pressure was 112. She was somewhat delirious. That night she appeared fairly well although more toxic than usual. At three o'clock the following morning her systolic blood pressure dropped to 75 and she became pulseless. Adrenalin and caffein failed to improve the condition. Soon after seven o'clock she died.



Discussion

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

What do you infer from that statement about the arm, knee and ankle jerks not being elicited?

A Student: Wouldn't the toxemia that goes with her acute febrile condition account for the absence of reflexes?

Another Student: I think it would increase them.

Third Student: I think it depends on the stage. In the early stage there is a little irritation of the nerves and the reflexes are increased. Later they may be absent.

Dr. Cabot: In a patient with meningitis, for instance, should you expect the reflexes to be increased?

A Student: They are increased at first, because of irritation in the spinal cord itself or along the nerves themselves.

Dr. Cabot: What does the absence of knee-jerks here mean? Is it a case of tabes, alcoholic neuritis, poliomyelitis of both legs, generalized neuritis that accompanied toxemia here? I think there is no statement to be made about infections in general. One thing I do know; in pneumonia, which from the record I believe this to be, the knee-jerks and other tendon reflexes are often gone, but are never increased in any stage, or if they are I have never seen it. The text books tell us that knee-jerks in pneumonia often cannot be obtained. What the physiology of this is I do not know. I do not think it is due altogether to delirium or cerebral clouding, for I have seen it in patients who have not had either.

NOTES ON THE PHYSICAL EXAMINATION

The pulse is said to be somewhat collapsing. Is there any way of checking up whether this is a true collapsing pulse or not? In view of the blood pressure what do you think?

Students: It was not much of a collapse.

Dr. Cabot: Why did they think it was collapsing? A sudden rise often present in infection gives to many men's finger tips the same impression that is caused by a very big rise followed by a big fall, which is a collapsing pulse.

What ought we to say about the systolic murmur?

A Student: It was due I think to the condition, high fever, increased blood flow, etc.

Dr. Cabot: That is, you would not infer any acute endocarditis or anything of that sort? I agree. The only thing that bothers me is what is said about the rasping quality of the murmur. We do not often hear of that in murmurs of this type. We shall probably hear more about it later if it persists.

What is the significance of herpes?

Students: That often goes with pneumonia—meningitis—malaria.

Dr. Cabot: Next is the common cold, coryza and sore throat, giving "cold sores" on the lips. Those are the three things with which we commonly see it. That is a real help. I have never seen it in typhoid. I do not think one sees it more than once in a thousand cases. But it occurs in a large percentage of cases of pneumonia.

Grunting expiration has come to be associated in many clinicians' minds with pneumonia, I think rightly, though I do not know the connection. But it is usually believed to be a useful point in diagnosis.

What is wrong in the physical signs at the right base? The fremitus ought to be increased. They are dubious about it and ought not to be. It ought to be obviously increased. That is usually one of the most reliable signs in differential diagnosis. We have bronchial breathing over solid and over fluid, increased voice over solid and over fluid. But tactile fremitus is almost never increased over fluid; it is generally increased over solid lung. When the question arises between solid and fluid, between pneumonia and empyema, tactile fremitus will sometimes serve you when nothing else will. That is one of the things that make me doubt the meaning of those signs.

A Student: Would the obesity account for it?

Dr. Cabot: I think not. I can see what is in your mind. There is a greater distance than usual between your hand and the source of vibration. But that does not work, for you press fairly hard when you put your hand on the chest and you get a pretty firm mass of tissue between yourself and the vibrating wall despite the fat.

A Student: Isn't a woman's voice less likely to give tactile fremitus than a man's?

Dr. Cabot: Yes, that is true. She may not have been able to speak loud enough to carry anything through.

The distention is very marked. What does that tell us?

Students: There is gas. Constipation.

Dr. Cabot: It sometimes occurs when the bowels are moving well. Marked distention says, "Go tell the family that the prognosis is becoming graver." There are few signs that we hate to see more than abdominal distention. It is alarming to clinicians and ought to alarm others. It is a much worse sign than delirium, although people are more troubled about that. Except failing pulse or sternomastoid breathing I do not know any worse sign.

Incontinence is also a bad sign, but not so bad as distention.

DIFFERENTIAL DIAGNOSIS

What else besides pneumonia could this be? I am including all kinds of pneumonia in this question.

A Student: Chronic heart trouble.

DR. CABOT: No; not with that temperature of 105.6° and the leukocytosis and those physical signs.

A STUDENT: Miliary tuberculosis.

DR. CABOT: Yes. Osler used to tell in his text book that he once demonstrated a case in the amphitheater as pneumonia, and the next week acknowledged his mistake and demonstrated the same case to the same class as miliary tuberculosis, because the bacillus had been found in the meantime. He was honest in that as in all things. So that is always a possibility. I do not know how it can be ruled out. Miliary tuberculosis is usually secondary to some old tuberculous focus. There is no evidence of an old focus here. But even though a focus exists we often cannot find it. So that does not rule out miliary tuberculosis.

Can it be empyema? Yes; but it would be a post-pneumonic empyema, so that the distinction would not be very great. Almost every case of pneumonia has some pleurisy. If that goes far enough we get empyema. That is not important enough to consider much. Could it be a serous pleurisy?

STUDENTS: You would expect the voice sounds to be decreased. Would there be more pain? Expiratory grunt?

DR. CABOT: I have never happened to hear an expiratory grunt with serous pleurisy. But a more serious objection is that she died. No one ever died from serous pleurisy. One can go around with it for weeks and not know it. One does not go around for weeks with pneumonia like this.

There are other diseases of the lung. Cancer of the lung runs a longer course. Abscess would not kill in this time. Emphysema does not give any such signs. Bronchitis does not give any such signs. There is nothing else to consider except miliary tuberculosis. I do not believe it is that. I wholly believe it is pneumonia. The chances are it is lobar pneumonia, but we never can be sure in distinguishing between lobar pneumonia and bronchopneumonia. What complications are there?

A STUDENT: Why couldn't the terminal pneumonia be due to some other infection?

DR. CABOT: It could, if you have any other condition.

A STUDENT: How about nephritis?

DR. CABOT: Yes; but isn't the nephritis just as acute as the pneumonia? We have no evidence of chronic nephritis. The kidney condition is well worth studying. With a patient as sick as this we do not make all the tests that we might make in another case. I cannot say on the evidence that we have whether we shall find that this is a nephritis or merely a condition that goes with any infectious disease. We give them various names, but fever kidney or the kidney of infection can give all the signs that we have here in the urine; or acute nephritis can do it. I think it cannot possibly be a nephritis to which the pneumonia was secondary. It may be nephritis secondary to pneumonia or part of the same general infection.

The heart we have discussed. Acute endocarditis is very unlikely I should say. Pericarditis is a little more probable. Many cases of pneumonia spread to the heart, especially pneumonia on the left. This is right sided, therefore not quite so likely. We often have cases of pericarditis without any physical signs.

A STUDENT: Do you attach any significance to vomiting and epigastric pain except as symptoms of pneumonia?

DR. CABOT: No. They are very common in pneumonia. I have seen people deceived again and again when there are no lung signs, but just pain and vomiting. The main things to help us are the fever and the leukocyte count. They do not come from acute stomach trouble, although the possibility of perforated ulcer has to be kept in mind.

A STUDENT: Are we going to have passive congestion outside the pneumonia?

DR. CABOT: I suppose so. The heart should not fail until just at the end, but it may cause passive congestion in the uninvolved lung.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lobar pneumonia.
Cardiac failure.
Obesity.

DR. RICHARD C. CABOT'S DIAGNOSIS

Pneumonia, probably lobar.
Passive congestion of the uninvolved lung.

ANATOMIC DIAGNOSES

1. *Primary disease.*

Lobar pneumonia, Type I.
Empyema.

3. *Historical landmarks.*

Chronic cholecystitis.
Cholelithiasis.

Dr. Tracy B. Mallory: A lobar pneumonia was present at the right lower lobe, which was approximately twice its normal size. The entire right lung was adherent with old fibrous adhesions to the parietal thoracic wall, so that presumably the patient had had a previous pneumonia, possibly pleurisy of some other type. Between the bands of fibrous adhesions were numerous pockets of pus, one of which on the anterior surface, very close to the sternal border, contained nearly 40 cubic centimeters, and I think could be classified as a small encysted empyema. The lower lobe on the opposite side showed a slight very fresh bronchopneumonia, a fresh extension of the process. The remainder of the lung showed a moderate amount of congestion and edema.

The heart was normal in size, the valves and the coronary arteries negative.

The gall-bladder contained a number of stones.

The kidneys were normal in size. The capsules stripped perfectly readily, with no evidence of any nephritis in gross.

The pus from the empyema cavity, also from the consolidated lobe, showed a pneumococcus which was not however a Type IV but a Type I. The pneumococcus Type IV can of course give a lobar pneumonia, but I think relatively much less often than Types I and II. There is no question that the sputum on which the first typing was made was an unsatisfactory sample, presumably just a specimen from the mouth or nasopharynx, where the Type IV is an habitual organism.

Dr. Cabot: Bear in mind the sediment of this urine. Many people would be deceived into thinking it must mean nephritis. Dr. Mallory did not see anything nephritic. It is also slightly discouraging to report that he could not be sure between bronchopneumonia and lobar. It is discouraging when we try to make a differential diagnosis between lobar and bronchopneumonia to find that they are both there. Is it a fairly common thing to have two kinds of pneumonia in the same patient?

Dr. Mallory: I think it is not very uncommon to see a few scattered consolidated lobules on the opposite side or in other lobes accompanying a primary lobar pneumonia.

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THE CONSERVATIVE TREATMENT OF GANGRENE

SURGERY, like other human activities, has passed through a succession of phases. In the beginning, only operations of the greatest necessity were performed. These operations were essential to the preservation of life. Later, under the benign influence of anesthesia and surrounded by the safeguards of asepsis, the Surgeon became a pioneer and explored portions of the body hitherto unaccessible. Organs were sought out no matter where they hid, and were sometimes sacrificed, as we think today, unnecessarily. The ideals of surgery today demand more than the removal of a diseased part; they demand, if possible, the restoration of that part and its preservation for the future welfare of the patient. Kidney surgery has entered this phase of conservation. Pelvic surgery no longer consists in cleaning the pelvis down to its parietal peritoneum.

In this issue of the JOURNAL appear two papers devoted to the thesis that gangrene of the lower extremity should, in certain cases, be treated conservatively instead of by amputation. Painter, in a very complete article on thromboangiitis obliterans, repeats the observation which he made twenty years ago, that in many of these cases a collateral circulation can be developed which will clear up a beginning gangrene, or at least will so check its development that only a toe amputation will be necessary.

In support of Painter's observation there appears a paper by Morton on "The Circulation in Arteriosclerotic Gangrene of the Lower Extremity." Morton reports the results of ligating the popliteal vein, a procedure which has been followed at the University of Rochester during the past year. This operation was done upon nine patients with results which Morton considers "quite gratifying." In six of the patients amputation was required only for those toes and portions of toes which were gangrenous at the time of operation.

Articles such as these are truly constructive. "Only God can make a tree," and the same may be said in regard to the living foot. Any surgeon can amputate a leg; the true art of surgery consists in knowing when to do so, and when not to.

"AN ORGANIZATION FOR SUPPLYING HUMAN MILK"

UNDER this vague name the famous Wet Nurse Directory of Boston now carries on greater and more effective activities than ever before, supplying larger quantities of safer breast milk to infants in all sections of Massachusetts and even beyond.

The growth of the Directory is outlined by its founder, Dr. Fritz B. Talbot, elsewhere in this issue. Starting in 1910 purely as a directory for wet nurses who were kept in residence at the Massachusetts Babies Hospital, it consolidated and stabilized its activities two years later by the purchase of a house on Binney St., where, under the supervision of a housekeeper and a resident nurse, five to eight lactating mothers were kept always in residence, furnishing breast milk to be sent out, or themselves going into homes to nurse babies who were urgently in need of their services.

This method of meeting the problem was found to be costly and last year the house was sold, the Directory now making its headquarters at 270 Commonwealth Ave., and collecting the milk in the homes of its mothers. Because the terms "wet nurse" and "breast milk" were found by the prudish to be too suggestive of physical, though natural human physiology, the present uninformative name was adopted.

Some forty mothers are now regularly supplying the Directory with their surplus milk for which they are paid seven cents an ounce, averaging a monthly earning rate of $28.00; occasionally they have received as much as $100.00 a month. The milk is sold to the public at rates varying from 12 cents an ounce to hospitals up to thirty cents an ounce for private cases who can afford to pay this full rate. In addition large quantities are given away to the needy. In 1927 174,466 ounces were collected, nearly

double the amount collected in 1926. Of this amount 27,486½ ounces were given away to worthy cases.

The milk collected is drawn under sanitary conditions from mothers who have been found to be healthy. It is pooled, pasteurized, and refrigerated and distributed under conditions which are above reproach. The Directory is now, in addition, trying the experiment of evaporating to dryness its surplus milk.

Human milk need no longer be considered either as an unaccustomed luxury or as an unobtainable commodity. The Directory has gone into the business of collecting and distributing it along modern, efficient lines, not as a money-making enterprise, but as a worthy philanthropy. In this singularly useful line of work it is setting an example which is causing its leadership to be recognized over the country.

THE PRECEPTOR SYSTEM IN MEDICAL EDUCATION

"THE preceptor system in medicine is based upon the idea that medicine is an art as well as a science."[1] The physician must not only know, he must know how, and knowing how involves a knowledge of the conditions in which the physician must practice.

The first aim of the medical school is to train practitioners of medicine, and general practice is the field calling for the largest number of workers. It is also the field that is changing most rapidly and one in which success calls for the greatest versatility. The apprentice system of long ago gave an introduction to practice that most physicians would be glad to have had. Working with a successful physician day after day in his practice is an invaluable experience for the young doctor.

What may be regarded as the newer system of medical education makes no provision for supplying this introduction. But there is a need and efforts to meet the need are apparent in the development of "extra-mural" instruction, for example, at the Universities of California, Wisconsin and Michigan.

The "extra-mural" quality lies in the fact that the teacher is a man in general practice, generally remote from the medical school. Such a teacher is commonly spoken of as a preceptor and this introduces an idea somewhat foreign to medical education and important in its consequences. It is the idea of individual instruction, of which a beginning has been made at the Harvard Medical School. Here it is "intra-mural". It emphasizes the fact that the student learns certain things best from a teacher, true of every art, and recognizes the proper relative value of informal and formal teaching. We are beginning to see that mass education in medicine involves a contradiction in terms.

Just how this change is to made in the system of medical education will be determined by the circumstances in which each school is placed. In California a few students in their fourth year are sent out to selected alumni of the School. In Wisconsin, advantage is taken of the clinical centers developed in "group practice," which is so rapidly growing in certain parts of the country. Each school may have its own way of attacking the problem.

But the experiments that have been carried on in the last few years in individualizing instruction and in familiarizing the student with the conditions in which he is to practice his art, are among the signs of the coming new day in medical education.

REFERENCE

1 Extra-mural Clinical Teaching. Bardeen-Cabot-Schmitt-Zapffe. Bull. Assoc. Amer. Med. Colleges, Vol. 3, No. 1, Jan., 1928, pg. 31.

RABIES AND ITS TREATMENT

ANOTHER death from rabies has occurred in Massachusetts. The boy was bitten on or about August 4th. The physician who first treated the case rather belittled the lacerations while the descriptions from the parents would make one feel that they were extensive over the arms and face. *Local treatment of the wounds only was given during the five days that the boy was under observation.* On September 17th the boy was taken to the hospital with some doubt as to the diagnosis. This was finally made and confirmed by examination of the brain.

The doctor first seeing the case states that he called a general hospital and was told that they had no material for prophylactic inoculations on hand. He also called the police and received no information from them regarding the dog. He then states that he pushed the matter no further *because he had no information about the dog.* In view of the fact that Massachusetts communities have demonstrated their lack of interest in controlling this disease through restraint of dogs, the lavish use of Pasteur prophylaxis is the only protection against increased deaths from this disease. The law authorizes local boards of health to spend money for "necessaries . . . for the safety of the inhabitants" so that there is no excuse for the least delay in administration of these inoculations for economic reasons.

The Department of Public Health has recently declared all dog bites reportable. Up to now only dog bites which in the opinion of the physican were sufficiently serious to require Pasteur treatment have been so reportable. From experience in this case it would seem that the judgment of the physician is not sufficient and that for the present emergency, at least, all bites must be reported.

Comment on the situation in connection with the recent death would seem to be unnecessary!

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

CANNON, W. B. A.B., A.M., S.D., LL.D., M.D. Harvard 1900. George Higginson Professor of Physiology, Harvard Medical School. His subject is: "Reasons for Optimism in the Care of the Sick". Page 593. Address: Harvard Medical School, Boston 17, Mass.

PAINTER, CHARLES F. M.D. Harvard 1895. His subject is: "Thrombo Angiitis Obliterans". Page 598. Address: 520 Commonwealth Avenue, Boston.

MORTON, JOHN J. A.B., M.D. Johns Hopkins 1913. F.A.C.S. Formerly Assistant Orthopedic Surgeon, Children's Hospital, Boston; Assistant Professor, Surgery, Yale 1921-1924; Assistant Attending Surgeon, New Haven Hospital 1921-1924. Professor Surgery, University of Rochester School of Medicine and Dentistry 1924; Now Surgeon-in-Chief, Strong Memorial and Municipal Hospitals, Rochester, N. Y. 1924. His subject is: "The Circulation in Arteriosclerotic Gangrene of the Lower Extremity". Page 607. Address: Strong Memorial Hospital, Rochester, N. Y.

TALBOT, F. B. A.B., M.D. Harvard Medical School, 1905. Clinical Professor Pediatrics, Harvard Medical School; Chief Children's Medical Department, Massachusetts General Hospital. His subject is: "An Organization for Supplying Human Milk". Page 610. His address is: 270 Commonwealth Avenue, Boston.

SOPER, GEORGE A. B.S., M.A., Ph.D. Managing Director, American Society for the Control of Cancer. His subject is: "New Aspects of the Cancer Problem". Page 612. Address: 25 W. 43rd Street, New York City.

The Massachusetts Medical Society

STATED MEETING OF THE COUNCIL

THE Council will meet in John Ware Hall, Boston Medical Library, 8 The Fenway, Boston, Wednesday, October 3, 1928, at 12 o'clock, noon.
Business:

1. Reading minutes of last meeting in abstract.
2. Reports of Standing Committees, of Arrangements, on Publications, on Membership and Finance.
3. Petitions for restoration to the privileges of fellowship.
4. Reports of Special Committees namely: On Clinics and Health Associations; To consider ways and means of acquiring a permanent home for the Society; To investigate the Workmen's Compensation Act.
5. Appointment of an Auditing Committee.
6. Other appointments, if any.
7. Incidental Business.

WALTER L. BURRAGE, *Secretary.*
Brookline, September 26, 1928.

Councillors are reminded to sign one of the attendance books before the meeting.

THE BOSTON MEDICAL LIBRARY

COLONIAL MEDICAL WORTHIES

HOWEVER much the world may owe to individual genius, and this debt is very great, it nevertheless is team work that counts most heavily in the end. This is exemplified in very many ways. In the founding of the first medical school in this country it was to the combined efforts of two men that most of the credit is due. The University of Pennsylvania owes its inception and its early recognition as a worthy educational center for the study of medicine, to Drs. Bard, Shippen, Morgan, Kuhn, and later Benjamin Rush. At least three of these, it is interesting to note, obtained their preliminary education under Dr. Finlay at the Nottingham School in Maryland. He was evidently a man of unusual influence with youth, as he appears to have made a profound impression upon certain of his above named pupils. His ability in this line, presumably, was a determining factor in his receiving a call to the presidency of Princeton College.

WILLIAM SHIPPEN, M.D.

William Shippen was the son of a distinguished physician of Philadelphia who in turn was descended from one of William Penn's associates in the founding of Pennsylvania. He was born in 1736 in Philadelphia and spent the early years of his life in that city. He attended the grammar school in Nottingham where he came under the influence of Mr. Finlay. One of the advantages of schooling under Mr. Finlay was the thorough drilling given in the ancient languages. He also paid particular attention to public speaking and when Shippen graduated at the College of New Jersey, (Princeton) in 1754 he was valedictorian of his class and was urged by Mr. Whitefield, the preacher, who heard the address, to enter the ministry, declaring he had never heard better speaking. He was only eighteen at this time. The next three years he spent in Philadelphia with his father as an apprentice in medicine. He then went to London where he took up his residence with Mr. William Hunter and worked with him and his younger brother John, studying comparative anatomy. During this period he came in frequent association with Dr. Pringle who inspired in him an interest in pathological anatomy. The celebrated Dr. Fothergill also took a great interest in him because he came from Philadelphia where he knew some of the doctors and was aware of the establishment of the University of

Pennsylvania Hospital. He also devoted a good deal of time while in London to the study of obstetrics, under Dr. McKenzie. He obtained his medical degree from Edinburgh where he was a great admirer of Cullen and the elder Munro. After obtaining his degree he secured permission to travel in France as professional attendant upon a wealthy invalid. France and England were then at War and it was only through the help of George the II that he secured this permission. While there he took advantage of the opportunity to see some of the French physicians. In 1762 he returned to Philadelphia bringing with him drawings, paintings and models which Dr. Fothergill had prepared for the Pennsylvania Hospital. These Dr. Shippen used in his teaching of anatomy, at first outside of any University connection but in 1765 Dr. John Morgan petitioned the Trustees of the University of Pennsylvania to establish a medical school and they immediately appointed Dr. Shippen to the chair of Anatomy and Surgery. For fourteen years these lectures were delivered until interrupted for a few years by the Revolutionary War. During this time he had taught about 300 students, many of whom subsequently went abroad to complete their studies. He was universally regarded as without a superior anywhere as a teacher. During the War he was Director General of the Medical Department. When he resigned his post in 1781 he returned to Philadelphia and took up his teaching and practice, adding to it the teaching and practice of obstetrics in which be became equally distinguished. Following the loss of his very brilliant son in whose career he was more than commonly concerned he gradually relinquished his practice and teaching, seeking solace in Religion. Ill health attacked him and he developed a hydrothorax which compelled him to give up work and shortly after retiring to Germantown he suffered from an attack of anthrax which caused his death on the 11th of July, 1808.

JOHN MORGAN

John Morgan, associate with Dr. William Shippen in founding the University of Pennsylvania's Medical department was a native of Philadelphia and like him received his early education under the celebrated Dr. Finlay. He was a well versed classical scholar and was the recipient of the first literary honors conferred by the College of Philadelphia, in 1757. After graduating from here he was apprenticed to Dr. John Redman of Philadelphia. After finishing his apprenticeship he went into military service in the war between the French, English and Americans. He resigned from the Army in 1760 and sailed for Europe to complete his medical studies. He first spent some time with William Hunter, then going on to Edinburgh where he studied under Munro, Cullen, Rutherford and others. He remained here two years, and upon presentation of a thesis on the "Formation of Pus", which he had publicly to defend, he was given the degree of Doctor of Medicine. From Edinburgh he went to Paris and gained such distinction there that he was admitted to the Academy of Surgery of Paris. He travelled through Italy and Holland where he met the leading literary and medical men of the time, notably Voltaire and Morgagni. When he returned to London he was elected a Fellow of the Royal Society, a licentiate of the College of Physicians in London and a member of the College of Physicians of Edinburgh. It was while he was in Great Britain that he and Dr. Shippen conceived the idea of establishing a medical department at the University of Pennsylvania and when he returned in 1765, laden with honors, he was elected Professor of the Theory and Practice of Medicine at the College of Philadelphia. In 1769 he had the gratification of seeing the graduation of the first five physicians educated in America. Besides his medical activities he had a keen interest in establishing the American Philosophical Society. In 1775 he was appointed Director of the Medical activities of the Continental armies, a task over which he worked very hard but with little success, through no fault of his own. His resignation was demanded but later he was fully exonerated. He died in his fifty-fourth year in Philadelphia on October 15, 1789.

Benjamin Rush, the third of the trio taking an important part in organizing the University of Pennsylvania's School of Medicine, was noted in this column on September 6th.

MASSACHUSETTS LEGISLATIVE NOTES

OUR LEGISLATIVE PROBLEM

The JOURNAL publishes today a list of candidates nominated for the Senate and House at the recent primaries. In the Senate only fourteen renominations have been made. President Wells was not a candidate for re-election. Senators McLane of Fall River, Bliss of Malden, Annis of Lynn, Cox of Chelsea, Holden of Worcester, Bessette of New Bedford, and Gallup of North Adams have been defeated according to the first returns. Thus the Senate will have a new President and new leaders.

If the Medical Profession is in earnest in endeavoring to protect the public health by making vaccination compulsory for children attending private schools as it is now for those attending public schools there is an excellent chance of winning a victory in the Senate, as well as in the House.

In the recent past the Washburn bill which aimed to abolish existing discriminations has been quietly defeated in the Senate. Under new leadership and with new members in the Senate ready to consider the matter on its merits the chance for the passage of the bill is excellent.

There is, however, no reason to assume that it will be passed unless the Senators understand the reasons for its passage. Every argument against vaccination, even though absolutely specious, will be

fully and ably presented by a small but very active body of individuals.

If the members of the Massachusetts Medical Society and of the Massachusetts Homeopathic Medical Society will interview or write to their prospective Senators and Representatives they will aid greatly in securing the passage of this public health measure.

The present law requires the vaccination of children attending public schools. The Washburn bill does away with any discrimination between those who attend private and public schools and also provides that a physician granting a certificate of exemption shall state his reasons for the certificate which shall be good for one year only.

MASSACHUSETTS SENATE

Cape and Plymouth
*Donald W. Nicholson, R., Wareham.

First Bristol
*James G. Moran, R., Mansfield.
James P. Lamont, D., Taunton.

Second Bristol
James H. Kay, R., Fall River.
William S. Conroy, D., Fall River.

Third Bristol
Nathaniel P. Sole, R., New Bedford.
Charles L. Booth, D., New Bedford.

Plymouth
Roger Keith, R., Brockton.
Joseph La Fontaine, D., Brockton.

Norfolk and Plymouth
Henry F. Ripley, R., Hingham.
John H. Moran, D., Weymouth.

Norfolk
*Henry L. Kincaide, R., Quincy.

First Suffolk
Hugh F. McCarthy, D., Chelsea.
Conde Brodbine, R., Revere.

Second Suffolk
Lamy Rivorie, R., Boston.
John P. Buckley, D., Boston.

Third Suffolk
Henry Parkman, Jr., R., Boston.
Frank J. Lehan, D., Cambridge.

Fourth Suffolk
Mary M. Riley, R., Boston.
*Robert E. Bigney, D., Boston.

Fifth Suffolk
John M. Brennan, R., Boston.
Michael J. Ward, D., Boston.

Sixth Suffolk
*Gaspar G. Bacon, R., Boston.
Bernard C. Dwyer, D., Boston.

Seventh Suffolk
Frederick E. Hawley, R., Boston.
Joseph J. Mulhern, D., Boston.

Eighth Suffolk
*Thomas H. Bilodeau, R., Boston.
John F. Buckley, D., Boston.

First Essex
Frank W. Osborne, R., Lynn.
William F. Shanahan, D., Swampscott.

Second Essex
James A. Torrey, R., Beverly.
James D. Burns, D., Salem.

Third Essex
Cornelius F. Haley, R., Rowley.

Fourth Essex
*J. Bradford Davis, R., Haverhill.
Clarence P. Kidder, R., Cambridge.
Patrick J. Doran, D., Amesbury.
Joseph W. Monahan, D., Belmont.

Fifth Essex
James E. Warren, D., Lawrence.

First Middlesex
Arthur W. Hollis, R., Newton.
Edward J. Carey, D., Framingham.

Third Middlesex
*Warren C. Daggett, R., Somerville.
Ernest C. Carr, D., Somerville.

Fourth Middlesex
Angier L. Goodwin, R., Malden.

Fifth Middlesex
*George G. Moyse, R., Waltham.
Paul A. Mogan, D., Waltham.

Eighth Middlesex
Michael H. Hoar, D., Lowell.

Sixth Middlesex
*Charles C. Warren, R., Arlington.
Charles T. Daly, D., Medford.

First Worcester
*Charles W. Johnson, R., Worcester.
Thomas E. Dowd, D., Worcester.

Second Worcester
George H. Nelson, R., Worcester.
James J. McGrail, D., Worcester.

Third Worcester
Thomas J. Worrell, R., Athol.
John H. Weaver, D., Leominster.

Fourth Worcester
Elbert M. Crockett, R., Milford.
Andrew J. Leath, D., Brookfield.

Franklin and Hampshire
Cady R. Elder, R., Amherst.

Worcester and Hampden
Warren E. Tarbel, R., East Brookfield.
Andrew J. Leach, D., Brookfield.

Berkshire
J. Arthur Baker, R., Pittsfield.

Berkshire, Hampshire, Hampden
*Frederick E. Judd, R., Southampton.

First Hampden
C. Wesley Hale, R., Springfield.
John S. Kane, D., Springfield.

Second Hampden
Walter M. Grocki, R., Chicopee.

Norfolk and Middlesex
*Samuel H. Wragg, R., Needham.

Norfolk and Suffolk

*Erland F. Fish, R., Brookline.
Daniel F. O'Connell, D., Brookline.

*Indicates renomination.

REPRESENTATIVES

Barnstable County

District
1 — William A. Jones, R., Barnstable.
2 —*Francis H. Perry, R., Brewster.

Berkshire County

District
1 — Joseph N. Roach, R., North Adams.
2 —*Elmer L. McCulloch, R., Adams.
George L. Duggan, D., Adams.
3 — John L. FitzGerald, D., Pittsfield.
Mark H. Smith, D., Pittsfield.
*William A. Akeroyd, R., Lanesboro.
*Ralph E. Otis, R., Pittsfield.
Harry D. Sisson, R., Pittsfield.

4 — Charles H. Shaylor, R., Lee.
Thomas F. Leary, D., Lenox.
5 — W. Taylor Day, R., Great Barrington.
William H. Heffernan, D., Great Barrington.

Bristol County

District
1 —*Charles S. Holden, R., Attleboro.
*Francis J. Kelley, R., North Attleboro.
2 — Samuel Knowles, R., Easton.
Thomas A. O'Connor, D., Easton.
3 — Noah Lemaire, R., Taunton.
John H. Hackett, D., Taunton.
4 — Levi L. Wetherbee, R., Taunton.
Harold J. Morris, D., Taunton.
6 — Louis N. Blanchette, R., New Bedford.
*Lawrence T. Woolfenden, R., New Bedford.
Emile J. Gravel, D., New Bedford.
Henry O. Saucier, Jr., D., Acushnet.
7 — Philip Barnett, R., New Bedford.
*Chester W. Chase, R., New Bedford.
John F. Begley, D., New Bedford.
William A. Brightman, Jr., D., New Bedford.
8 —*John Halliwell, R., New Bedford.
Edgar F. Howland, R., New Bedford.
Arthur Goulart, D., New Bedford.
Patrick J. Coyne, D., New Bedford.
9 —*John Ford, D., Fall River.
Felix J. Dussault, D., Fall River.
*Benjamin Barnes, R., Fall River.
Robert L. Manly, R., Fall River.
10 — Francis Kearney, D., Fall River.
11 — Thomas N. Ashton, R., Fall River.
Louis E. Hathaway, R., Fall River.
Thomas Smith, Jr., R., Fall River.
William H. Keating, D., Fall River.
12 —*Thomas C. Crowther, R., Fall River.
*William F. Thomas, R., Fall River.
Thomas Long, D., Fall River.
Joseph Plante, D., Fall River.

Dukes County

District
1 — Ernest J. Dean, R., Chilmark.

Essex County

District
1 — James W. Clark, R., Amesbury.
Joseph O. Donnell, D., Amesbury.
2 —*Allan B. MacGregor, R., Haverhill.
Philip H. Stacey, R., Haverhill.
*Archibald M. Estabrook, R., Haverhill.
Cornelius P. Driscoll, D., Haverhill.
3 — Maurice C. Casey, D., North Andover.
Edward W. Glennon, D., Lawrence.
William A. Menzie, D., Lawrence.
*Robert W. Dow, R., Methuen.
*Henry D. Rockwell, R., North Andover.
*Carl A. Woekel, R., Methuen.
4 —*Michael H. Jordan, D., Lawrence.
5 — James P. Meehan, D., Lawrence.
John W. Chase, R., Lawrence.
6 —*Arthur F. Ganley, D., Lawrence.
Thomas J. Lane, D., Lawrence.
Thaxter Eaton, R., Andover.
Charles Cate, R., Lawrence.
7 — Ralph Wheelwright, R., Danvers.
8 —*John A. Jones, D., Peabody.
9 — Walter J. Frawley, D., Lynn.
Michael Zack, D., Lynn.
*Charles W. Ames, R., Lynn.
*Charles Simonds, R., Lynn.
10 — Michael H. Cotter, D., Lynn.
*Tony A. Garofano, D., Saugus.
Daniel J. O'Connor, Jr., D., Lynn.
Harriet R. Hart, R., Lynn.
Fred A. Hutchinson, R., Lynn.
*C. F. Nelson Pratt, R., Saugus.
11 — Hugh F. McDermott, D., Lynn.
*Alfred W. Ingalls, R., Lynn.
*William A. Baldwin, R., Lynn.
Marion C. Burrows, R., Lynn.
Thomas H. Donahue, D., Lynn.
Albert J. Jennings, D., Lynn.
12 — Malcolm L. Bell, R., Marblehead.
Harry E. Day, R., Salem.
13 — Edward E. Merrill, R., Salem.
Denis J. Sullivan, D., Salem.
14 — George H. Estes, R., Salem.
Francis E. Rafter, D., Salem.
15 — Bayard Tuckerman, Jr., R., Hamilton.
John C. Wilson, R., Beverly.
Joseph F. Lynch, D., Wenham.
James MacPherson, D., Beverly.
16 — Martha N. Brooks, R., Gloucester.
17 —*Harold B. Webber, R., Gloucester.
Pius P. McPhee, D., Gloucester.
18 — Seth H. Boardman, R., Georgetown.
*Willard S. McKay, R., Newburyport.

Franklin County

District
1 —*Andrew C. Warner, R., Sunderland.
2 —*John Sauter, R., Greenfield.
James F. Lawler, D., Greenfield.
3 — Charles H. Holmes, R., Erving.

Hampden County

District
1 — Frank G. Maguire, R., Monson.
Daniel W. O'Connor, D., Palmer.
2 — Frank O. Scott, R., West Springfield.
William J. Sessions, R., Hampden.
Joseph P. Vincelette, D., Agawam.
3 — Wilfred J. Chevalier, R., Springfield.
4 — Nicholas G. V. Nestor, R., Springfield.
Edward M. Cawley, D., Springfield.
5 —*John K. Joy, Jr., R., Springfield.
John W. Maxwell, D., Springfield.
6 — Emma E. Brigham, R., Springfield.
7 — Tycho M. Petersen, R., Springfield.
Hattie E. Hammond, D., Springfield.
8 — Richard H. Stacy, R., Springfield.
Charles B. Foley, D., Springfield.
9 — Norman L. Snow, R., Springfield.
Walter A. Swift, D., Springfield.
10 —*Daniel J. Coakley, D., R., Chicopee.
11 — Paul G. Martel, D., R., Chicopee.
12 — Charles D. Chevalier, D., R., Holyoke.
13 — Francis P. Clark, D., R., Holyoke.
14 — William E. Kirkpatrick, R., Holyoke.
15 — Dexter A. Snow, R., Westfield.
Joseph F. Geehern, D., Westfield.

Hampshire County

District
1 — Edwin L. Olander, R., Northampton.
Levi C. Dayton, D., Northampton.
2 — Thomas MacBean, R., Easthampton.
3 — Frank A. Brainerd, R., South Hadley.
John R. Callahan, Jr., D., Hadley.
4 — Alvin R. Lewis, R., Belchertown.
Roland D. Sawyer, Ware.

Middlesex County

District
1 — Minor F. Hamlin, R., Cambridge.
Edward A. Kollen, R., Cambridge.
Dennis F. McCarthy, D., Cambridge.
*George C. McMenimen, D., Cambridge.
2 —*Harold M. Bradbury, R., Cambridge.
Ralph N. Hamilton, R., Cambridge.
Edward J. Gurry, D., Cambridge.
Timothy D. Sullivan, D., Cambridge.
3 — Charles T. Cavanagh, D., Cambridge.
Paul A. Dever, D., Cambridge.
Timothy J. Cronin, D., Cambridge.
*Arthur L. Blanchard, R., Cambridge.
N. Russell Cazmay, R., Cambridge.
*Louis L. Green, R., Cambridge.
4 — William B. Baker, R., Newton.
*Rupert C. Thompson, R., Newton.
James P. Gallagher, D., Newton.
Daniel O'Connell, D., Newton.
6 — Alexander J. Mitchell, R., Natick.
Jeremiah J. Healy, D., Natick.
7 —*Albert W. Bullock, R., Waltham.
*Arthur A. Hansen, R., Waltham.
*Arnold Leonard, R., Watertown.
Edward D. Holland, D., Watertown.
Charles A. Whalen, D., Waltham.
8 — Thomas G. Portmore, R., Framingham.
Harry L. Adams, R., Holliston.
Joseph E. Haley, D., Holliston.
John J. Sheehan, Jr., D., Framingham.
9 — William H. Wellen, R., Marlboro.
10 — Leslie W. Sims, Maynard.
William P. Walsh, D., Hudson.
11 —*Edward J. Robbins, R., Chelmsford.
12 — George T. Keyes, R., Pepperell.
Michael E. Markham, D., Ayer.
13 — B. Farnum Smith, R., Concord.
14 —*Henry Achin, Jr., R., Lowell.
Victor F. Jewett, R., Lowell.
Frank E. McLean, R., Lowell.
*Azarie Z. Coutu, D., Lowell.
J. Arthur Paradis, D., Lowell.
15 — James F. Mahan, R., Lowell.
*Daniel F. Moriarty, D., Lowell.
Patrick F. Nestor, D., Lowell.
16 — Frank K. Stearns, R., Lowell.
Charles H. Slowey, D., Lowell.
17 — Harry D. Brown, R., Billerica.
18 — Daniel S. Jones, D., Woburn.
James H. McLaughlin, D., Woburn.
*Louis Ellenwood, R., Reading.
*Wilford A. Walker, R., Woburn.
19 — *Maynard E. S. Clemons, R., Wakefield.
Charles F. Young, D., Wakefield.
20 — John F. Cahill, D., Everett.
21 —*Burt Dewar, R., Malden.
*Howard Fall, R., Malden.
John V. Kimball, R., Malden.

James J. Kierstead, D., Malden.
Martin J. Sullivan, D., Malden.
22 — Mary L. Barrows, R., Melrose.
Harry E. Cryan, R., Melrose.
23 —*James E. Hagan, D., Somerville.
24 — William P. Corbett, D., Somerville.
Joseph J. Borgatti, D., Somerville.
John J. Murphy, D., Somerville.
William J. Bell, R., Somerville.
*Charles E. Gerrish, R., Somerville.
Arthur G. Pearson, R., Somerville.
25 —*Hiram N. Dearborn, R., Somerville.
Frank A. Teele, R., Somerville.
Margaret A. Campbell, D., Somerville.
Lawrence J. McCahey, D., Somerville.
26 — Arthur L. Youngman, R., Medford.
*Richard D. Crockwell, R., Medford.
John J. Irwin, R., Medford.
John H. Burke, D., Medford.
Edwin M. Harkins, Medford.
Cornelius B. Harrington, D., Medford.
27 — Joseph E. Perry, R., Belmont.
Edward J. Morse, D., Belmont.
28 —*Elliott R. Barker, R., Arlington.
*George E. Briggs, R., Lexington.
29 —*Thomas R. Bateman, R., Winchester.
Whitfield L. Tuck, D., Winchester.

Nantucket County

District
1 —*Arthur W. Jones, R., Nantucket.

Norfolk County

District
1 — James F. McGowan, D., Dedham.
John Dilfenthal, D., Dedham.
2 —*Albert F. Bigelow, R., Brookline.
*Arthur P. Crosby, R., Brookline.
*Renton Whidden, R., Brookline.
3 — Thomas S. Burgin, R., Quincy.
William R. Thomas, R., Quincy.
Thomas E. Connelly, D., Quincy.
Robert J. Egan, D., Quincy.
4 — John J. Cusick, D., Quincy.
*Edward J. Sandberg, R., Quincy.
5 — Thomas J. Terry, D., Weymouth.
*Newland H. Holmes, R., Weymouth.
6 — Horace T. Cahill, R., Braintree.
Joseph D. Drinkwater, D., Braintree.
7 —*Josiah Babcock, R., Milton.
8 — Henry W. Caldwell, R., Walpole.
Frank B. Coughlin, D., Norwood.
9 — Everett C. Crane, R., Avon.
Henry V. Morgan, D., Randolph.
10 — Joseph F. Stone, R., Canton.
Edward W. Murphy, D., Canton.
11—*Horace W. Hosie, R., Franklin.
William S. Cruickshank, D., Foxboro.
12 — Millard B. LaCroix, R., Millis.
Leo A. Murray, D., Bellingham.

Plymouth County

District
1 — Ira C. Ward, R., Plymouth.
Amedeo V. Squarzi, D., Plymouth.
2 —*Ernest H. Sparrell, R., Norwell.
Thomas F. Hernan, D., Scituate.
3 — Edgar T. Brickett, R., Cohasset.
William H. Morris, D., Cohasset.
4 — Lawrence E. Blanchard, R., Rockland.
*William H. McCarthy, D., Rockland.
5 —*Ralph A. Stevens, R., Whitman.
John A. Brouillard, D., Whitman.
6 — Orvis F. Kinney, R., West Bridgewater.
7 —*Hendrick H. Washburn, R., Middleboro.
George F. Tucker, D., Middleboro.
8 —*John Homes, R., Brockton.
Charles C. Lucey, D., Brockton.
9 —*M. Sylvia Donaldson, R., Brockton.
H. Merton Snow, R., Brockton.
Joseph H. Downey, D., Brockton.
Louis E. Moreau, D., Brockton.
10 — Charles J. Hallender, R., Brockton.
John P. Lyons, D., Brockton.

Suffolk County

District
1 — Marion Sinatra, R., Boston.
*William H. Hearn, D., Boston.
*William H. Barker, D., Boston.
James S. Coffey, D., Foston.
2 — Luke D. Mullen, D., Boston.
Charles S. Sullivan, Jr., D., Boston.
3 — Frank Squillacioti, R., Boston.
Michael Tedesco, R., Boston.
John P. Higgins, D., Boston.
Felix A. Marcella, D., Boston.
4 — Hugh Brennan, D., Boston.
John F. Curran, D., Boston.
Richard E. Johnston, R., Boston.
5 —*Henry L. Shattuck, R., Boston.
*Eliot Wadsworth, R., Boston.
Dennis F. McLaughlin, D., Boston.
6 —*William P. Hickey, D., Boston.
*James J. Twohig, D., Boston.
7 — Albert R. Bencks, R., Boston.
Eugene P. Durgin, D., Boston.
John J. Reardon, D., Boston.
8 — Terrance Adams, R., Boston.
Susan M. Fox, R., Boston.
Francis D. Dailey, D., Boston.
*Anthony A. McNulty, D., Boston.
9 — John P. Connelly, D., Boston.
Richard D. Gleason, D., Boston.
Frank E. Bryant, R., Boston.
Rolins Burrill, R., Boston.
10 — James M. Brennan, D., Boston.
*Thomas S. Kennedy, D., Boston.
11 —*Thomas H. Carr, D., Boston.
William F. Madden, D., Boston.
12 — James T. Burke, D., Boston.
William F. Doolin, D., Boston.
*Abraham B. Casson, R., Boston.
*Charles L. Page, R., Boston.
13 — Harry M. Murdough, R., Boston.
John V. Mahoney, D., Boston.
Ignatius J. O'Connor, D., Boston.
14 — James J. Lafferty, D., Boston.
Patrick J. Bowes, D., Boston.
*Isidore H. Fox, R., Boston.
Bernard Ginsberg, R., Boston.
15 — William C. Creed, D., Boston.
Jeremiah F. Driscoll, D., Boston.
16 — Mansfield Austin, R., Boston.
John A. Carlson, R., Boston.
*Joseph Finnegan, D., Boston.
*Francis J. Hicky, D., Boston.
17 —*Harrison H. Atwood, R., Boston.
James H. Richardson, R., Boston.
*Owen A. Gallagher, D., Boston.
Frank J. McFarland, D., Boston.
18 — Frederick W. Boynton, R., Boston.
Walter E. Wragg, R., Boston.
*Joseph A. Logan, D., Boston.
*Patrick J. Welsh, D., Boston.
19 — William M. McMorrow, D., Boston.
Joseph C. White, D., Boston.
William G. Marple, R., Boston.
*George Penshorn, R., Boston.
20 — Walter A. Murphy, D., Boston.
Patrick E. Murray, D., Boston.
*Harold R. Duffie, R., Boston.
*George A. Gilman, R., Boston.
21 — John F. Murphy, D., Boston.
*Martin Hays, R., Boston.
22 — Nelson J. Ingalls, R., Boston.
*Leo M. Birmingham, D., Boston.
23 —*Frank D. Crowley, R., D., Chelsea.
24 — John W. McLeod, R., Chelsea.
25 —*Augustine Airola, R., Revere.
Thomas F. Carroll, R., Revere.
James E. Fitzgerald, D., Revere.
Philip A. Sheridan, D., R., Revere.
26 —*Edgar F. Power, R., Winthrop.

Worcester County

District
1 — Clyde H. Swan, R., Barre.
2 —*Herman Pehrsson, R., Gardner.
*Albert L. Potter, R., Gardner.
Antony T. Beazydlo, D., Gardner.
Charles M. Day, D., Winchendon.
3 —*William Casey, D., R., Spencer.
Pierre Kasky, R., Spencer.
4 — Willis L. Baker, R., Charlton.
Edward W. Staves, R., Southbridge.
Julius Gaumond, D., Sturbridge.
*Wilfred J. Lamoreux, D., Southbridge.
5 — Wilfred P. Bazinet, D., R., Webster.
Albert H. Cohen, D., R., Webster.
*Joseph N. O'Kane, D., R., Dudley.
L. Adelard Breault, R., Auburn.
6 — Harold L. MacLaren, R., Sutton.
*John S. Derham, D., Uxbridge.
7 — O. Alton Pickering, R., Blackstone.
8 — George W. Knowlton, R., Upton.
L. Blaine Libby, R., Milford.
9 — George McLeod, R., Clinton.
Frank A. Powers, R., Bolton.
Joseph P. Taft, D., Clinton.
10 — Fred L. Butler, R., Leominster.
*Edward H. Nutting, R., Leominster.
Daniel Crowley, D., Leominster.
Ralph E. McGrath, D., Fitchburg.
11 —*Louis W. M. Des Chenes, R., Fitchburg.
*Henry A. Estabrook, R., Fitchburg.
Frank F. Allen, D., Fitchburg.
Robert F. Wilson, D., Fitchburg.
12 — Martin Swanson, R., Worcester.
James G. Nolan, D., Worcester.
13 — *Sven A. Ericson, R., Worcester.
James E. Mulvey, D., Worcester.
14 —*Edward J. Kelley, D., Worcester.
15 —*Charles A. Kelley, D., Worcester.

16 — Michael J. O'Shea, R., Worcester.
•Joseph W. Leyden, D., Worcester.
17 — Victor E. Rowlander, R., Worcester.
Mary G. Bernard, D., Worcester.
18 — Arthur T. Squires, R., Worcester.
William H. Dunn, D., Worcester.
19 —•Florence S. Slocomb, R., Worcester.
Anthony R. Doyle, D., Worcester.
20 —•George F. Brooks, R., Worcester.
James F. Grace, D., Worcester.
21 —•Slater Washburn, R., Worcester.
Edward J. Pryor, D., Worcester.

MISCELLANY

THE ELECTION OF DR. KENDALL EMERSON AS MANAGING DIRECTOR OF THE NATIONAL TUBERCULOSIS ASSOCIATION

Des Moines, Iowa, Sept. 17.—At a meeting of the Executive Committee of the National Tuberculosis Association here today Dr. Kendall Emerson of Worcester, Massachusetts, was elected Managing Director to succeed Dr. Linsly R. Williams of New York City, who resigned after six years of service to devote his entire time to the affairs of the New York Academy of Medicine, of which he is Director. Dr. Emerson will begin his new duties October 1. Dr. Emerson was born in 1875 and received the degree of B.A. from Amherst in 1897 and M.A. (Honorary) in 1922. He was graduated from Harvard University Medical School in 1901 and served an internship at the Massachusetts General Hospital, later engaging in general practice at Worcester, gradually specializing in bone and joint surgery. He has been a member of the staff of the Memorial Hospital at Worcester since 1903, during the last few years being Chief of the Surgical Service. He is a member of the American College of Surgeons.

In 1916 Dr. Emerson went to France as a Major in the Royal Army Medical Corps, later serving in the American army, and after the armistice became attached to the American Red Cross, serving in Siberia and later at Washington. From 1919 to 1921 in Paris he acted as Deputy Commissioner and Director of the Medical Service for Europe under the direction of Robert E. Olds.

In 1922 Dr. Emerson became Chairman of the Worcester County Tuberculosis Association and, shortly after, a Director of the Massachusetts Tuberculosis League. In 1926 he was elected President of the League and a representative director of the National Tuberculosis Association, becoming a member of the Executive Committee in 1927.

The National Tuberculosis Association now comprises associations throughout the country, devoted to the medical and social aspects of the control of the disease and financed by the annual sale of Christmas seals.

RECENT DEATHS

DORGAN—Joseph Aloysius Dorgan, a Fellow of the Massachusetts Medical Society, a graduate of Harvard Medical School in the class of 1898, died at his home in Lawrence of carcinoma of the tongue, July 25, 1928, aged 55.

STOWELL—Dr. Charles Henry Stowell, retired, died at his home in Lowell, September 17, 1928, at the age of 77.

He was born in Perry, Wyoming County, New York, October 27, 1850, a son of David Page and Mary Ann Blanchard Stowell, was educated in the common schools and pursued his medical studies at the University of Michigan, from which he was graduated in 1872. He was professor of histology and microscopy at that university from 1883 to 1889 and subsequently served on the editorial board of various medical publications. He had been editor and proprietor of *The Microscope*, and *National Medical Review*, as well as participating in the editorial conduct of *Food*, *Trained Motherhood* and *Practical Medicine*, having a residence during most of this period of his life in Washington.

He went to Lowell in 1897 at the time of the reorganization of the J. C. Ayer Company, makers of proprietary medicines, and, in 1900, became treasurer and general manager, holding this position until failing health compelled his retirement. Among the books and articles which he published were "Essentials of Health," "A Healthy Body," "Primer of Health," "Manual for Teaching Physiology," "Manual of Histology," "Microscopical Diagnosis," "The Stowell Genealogy" and a treatise on the New England poets.

Dr. Stowell is survived by his wife, who was Miss Louise M. Reed of Saginaw, Mich.

CORRESPONDENCE

SPECIAL NOTICE IN REFERENCE TO DOG BITES

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston

September 20, 1928.

Editor, New England Journal of Medicine:

At a meeting of the Public Health Council held on September 18, 1928, it was voted to modify our list of diseases declared dangerous to the public health under Section 6 of Chapter 111 of the General Laws, to the effect that all dog bites shall be reportable. Previous to this only such dog bites as in the opinion of the physician required anti-rabic treatment were reportable.

In view of the excessive prevalence of the disease, particularly in the eastern part of the State, this year and in view of recent experience with the disease in human beings, it would seem that for the emergency at least such change in the regulations will give increased assurance of adequate protection to the public.

In order that the profession may be informed at the earliest possible moment I would appreciate your giving this as much prominence as possible.

Yours truly,

George H. Bigelow, M.D.,
Commissioner of Public Health.

A HUMAN STORY

Dear Sir:

Those of your readers who see *The American Mercury* doubtless read in the August number "A Country Doctor by Dr. A. F. Van Bibber of Bel Air, Maryland. The story is so well told, so sane, so human, that I would fain incite professional brothers to look it up. In a personal letter Dr. Van Bibber

says it is his first literary effort and gives the following account of its origin:

> "You see, it all came about in rather a funny way. One day I was reading one of Mencken's book reviews in the *Mercury*, and I was flabbergasted by his assertion that 'if there were any really happy people in the world (aside from archbishops and actors) he had never met them or even heard of them!' This statement seemed to me so outrageous that I impulsively wrote to him, protesting that my town was swarming with happy people, and offering myself (with a brief statement of my circumstances) as one instance. I only did it in fun, with no idea that I was 'starting something'. But he replied promptly and charmingly, and added in a postscript the suggestion that I write an article for the *Mercury*, giving my formula for happiness, which I did,—and to my utter amazement he not only accepted it but paid me for it."
>
> F. C. SHATTUCK.

COMBINED MEDICAL MEETINGS BY FOUR MEDICAL GROUPS

September 18, 1928.

Editor, THE NEW ENGLAND JOURNAL OF MEDICINE:

It may be of interest to some of your readers to know that five of the Medical Meetings usually given at the Boston Medical Library during the winter by the Suffolk District Medical Society are this year to be given under the auspices of four medical groups. The Boston Medical Library, and three Districts of the Massachusetts Medical Society, the Suffolk, Norfolk and Middlesex South, have decided to combine in sponsoring these Meetings.

This, we believe, will be of real advantage for several reasons. Some of them are:

1. A large attendance should be assured the speakers.
2. That a larger number of the medical men of Greater Boston will meet on the same footing and will so get to know each other better.
3. At least a couple of Medical Meetings of smaller groups will be eliminated.

We hope the plan will meet the approval of the physicians involved and be sufficiently successful to justify its continuance.

Respectfully yours,

HILBERT F. DAY,

Chairman, Committee on Medical and Social Meetings, Boston Medical Library.

NOTICES

SEMI-CENTENNIAL CELEBRATION OF THE BOSTON CITY HOSPITAL NURSES' ALUMNAE ASSOCIATION

The Boston City Hospital Nurses' Alumnae Association will conduct a semi-centennial celebration, to be held at the Boston City Hospital in Boston, Mass., October 2, 3 and 4, 1928.

PROGRAM

October 2—2-5 P. M. Registration Tea at the Vose House.

October 2—8:30-10 P. M. Meeting of School and Alumnae at Jordan Hall.

October 3—12:30 Noon. Luncheon at the Convalescent Home, Milton.

October 3—3 P. M. Pageant at Convalescent Home, Milton.

October 4—10-4 P. M. Visit the Hospital.

October 4—7 P. M. Banquet, Hotel Statler.

COMMITTEE MEMBERS

Miss Vera Allen, Mrs. Ursula Noyes Brooks, Mrs. Anne Ryan Cahill, Miss Jessie E. Catton, Miss Isabelle Chipman, Miss Laura Coleman, Miss Louise Coleman, Mrs. Anne Zolla Curran, Mrs. Gertrude Quinn Dana, Miss Elizabeth C. Fairbank, Miss Rose M. Foster, Miss Catherine E. Galvin, Miss Anna L. Gibson, Mrs. Bess Huse Hepburn, Miss Emma J. Jones, Miss Clara Managhan, Mrs. Mary Kyle Margeson, Miss Mary Alice McMahon, Miss Emma M. Nichols, Mrs. Helen LeMaitre Papen, Miss Mary M. Riddle, Mrs. Mary Houston Salerno, Mrs. Amanda MacDonald Scannell, Mrs. Victoria Froude Walter, Miss Ida Washburne, Miss Ellen C. Daly, Chairman Program Committee.

REPORTS AND NOTICES OF MEETINGS

MEETING OF THE PLYMOUTH DISTRICT MEDICAL SOCIETY AND TESTIMONIAL TO DR. J. E. BACON

On September 18, 1928, Dr. Jonas E. Bacon of Brockton, who was given a testimonial in commemoration of fifty years' membership in the Massachusetts Medical Society by the members of the Plymouth District, Massachusetts Medical Society, gave to the committee in charge of the testimonial a dinner and entertainment at the South Shore Country Club, West Hingham, Mass.

Readings were given, after the dinner, by Professor Emil Lagergren.

A short business meeting was held, presided over by the President, Thomas H. McCarthy. He read letters received from Dr. Willis S. Campbell, Memphis, Tenn., and from Dr. George Crile, Cleveland, Ohio, well-known specialists. Dr. Crile will show moving pictures of the reduction of fractures by the latest methods at a future meeting. These two men are internationally known and it is gratifying that the Plymouth District Society is so fortunate in securing these two men to address the Society. It was unanimously voted to secure them by all means.

An invitation was received from the Lakeville Sanatorium to hold a meeting at that institution, some time in the near future. Dr. Charles G. Miles was appointed as reporter for the NEW ENGLAND JOURNAL OF MEDICINE.

Among the physicians present were Drs. Thomas H. McCarthy, Frederick W. Murdock, Loring B. Packard, Walter W. Fullerton, Joseph H. Lawrence, Charles G. Miles, Alfred C. Smith, David B. Tuholski, Pierce H. Leavitt and John P. Shaw, all of Brockton; Drs. Edgar I. Hill, Jonas E. Bacon and Wilfred G. Brown of Brockton; Dr. Richard B. Rand of Abington, Professor Emil Lagergren.

The physicians present gave Dr. Jonas E. Bacon a rising vote of thanks for his splendid entertainment at the South Shore Country Club.

THE COMBINED MEETING OF THE FOUR WESTERN COUNTIES

The 1928 meeting of the Four Western Counties Medical Societies was held at the Belchertown State School by invitation of its trustees. Dinner was served at 1:30 with about 70 present.

After dinner the Annual Business Meeting was held, with President F. B. Sweet in the chair.

Dr. T. S. Bacon, for the Trustees, welcomed the visitors and outlined the aims and accomplishments of the school.

It was voted that the Society accept the invitation of Dr. Huston to hold its next meeting at the State Hospital in Northampton.

The following were elected officers for the ensuing year: Dr. L. O. Whitman of Northampton, President; Dr. Charles Moline of Sunderland, Secretary; a committee, Drs. Howe, Peters and McLaughlin, was appointed by the chair to draw up resolutions in memory of the late Dr. A. P. Merrill of Pittsfield, who was one of the prime movers in starting the organization.

Following the business meeting Dr. McPherson explained in detail the admission and commitment of patients and conducted a clinic showing the various types of idiocy. After the clinic those attending were divided into small groups visiting the various wards and workshops of the school.

The day ended with a ball game in which the team captained by Dr. McPherson won by a score of 7 to 6. This victory was due to the magnificent battery work of McPherson and Link and the terrific slugging of Smith of Springfield. Mather of Greenfield made an error, while O'Brien's pitching deserved success. The umpire was considered impartial. The game was called on account of darkness and for other reasons at the end of the third inning. This meeting proved one of the most enthusiastic which has been held by the Society.

CHARLES MOLINE, *Secretary.*

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

The semi-annual stated meeting was held on Wednesday, September 26, 1928, at the Oakley Country Club, Watertown.

11:30 A. M. Business Meeting.

12 M. Dr. Eliot Luther of the State Commission spoke on the present Epidemic of Infantile Paralysis.

Discussion by Dr. John Lovett Morse, Newton; Dr. Charles B. Fuller, Waltham; Dr. Thomas C. Quirk, Watertown.

1 P. M. Dinner was served.

2 P. M. The golf course was open to members of the Society.

CLINICAL CONGRESS OF PHYSICAL THERAPY AND SEVENTH ANNUAL MEETING OF THE AMERICAN COLLEGE OF PHYSICAL THERAPY

Announcement is made of the third clinical Congress on Physical Therapy in conjunction with the seventh annual meeting of the American College of Physical Therapy, to be held at the Hotel Stevens, Chicago, October 8th to 13th, 1928. For the past year plans have been under way to make this 1928 Congress the most interesting one ever conducted and one which will be difficult to surpass in the future. So many novel and attractive features have been injected in the six day program that no physician, whether he is now doing physical therapy or whether he plans to do it later, can possibly afford to absent himself from this scientific gathering.

NORFOLK SOUTH DISTRICT MEDICAL SOCIETY

The first fall meeting of the Norfolk South District will be held at Norfolk County Hospital, South Braintree, on Thursday, October 4, at 12 noon.

Dr. Charles Whelan will be the speaker. His subject will be "Some further considerations on radium and X-ray therapy."

N. R. PILLSBURY, *Secretary.*

THE AUTUMN MEETING OF THE MASSACHUSETTS STATE NURSES' ASSOCIATION

The twenty-fifth autumn meeting of the Massachusetts State Nurses' Association will be held at Hotel Brunswick, Boston, October 23-24, 1928.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

PROGRAM FOR 1928-1929

Wednesday, October 17, 1928—Essex Sanatorium, Middleton. Joint meeting with Essex North and Middlesex East and West. Clinic at 5 P. M. Buffet supper at 7 P. M. Speaker: Dr. Edwin C. Bullock of Boston. Subject: Resuscitation from Electric Shock, Inhalation of Illuminating Gas, and Immersion in Water.

Thursday, November 1, 1928—Censors meet for examination of candidates at Salem Hospital at 3:30 P. M. Candidates should apply to the Secretary (Dr. R. E. Stone, Beverly) at least one week prior.

Wednesday, November 7, 1928 — Salem Hospital. Clinic at 5 P. M. Dinner at 7 P. M. Speaker: Dr. Harry Solomon, Boston. Subject: Syphilis of the Nervous System. Discussion by Drs. W. V. McDermott of Salem and C. A. Bonner of Hathorne (10 minutes each). Discussion from the floor.

Further announcements will follow.

PROGRAM OF THE COMBINED MEETINGS OF THE BOSTON MEDICAL LIBRARY, THE SUFFOLK DISTRICT MEDICAL SOCIETY, THE MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY AND THE NORFOLK DISTRICT MEDICAL SOCIETY

The following invitation has been circulated—

Dear Doctor:

You are cordially invited to attend the seven combined monthly meetings of the Boston Medical Library, Suffolk District Medical Society, Norfolk District Medical Society and Middlesex South District Medical Society to be held during 1928-1929, at the Boston Medical Library, 8 The Fenway, Boston, at 8:15 o'clock on the Wednesdays specified.

October 31, 1928—*Stated Meeting.* Symposium by the Staff of the Children's Hospital.

November 21, 1928—Meeting in association with Norfolk District Medical Society. "Recent Advances in Physical Therapy", Dr. F. B. Granger. Discussion opened by Dr. Frederick O'Brien.

December 19, 1928—*Surgical Section.* Symposium on Stomach Surgery. "Operative Procedures; Indications and Results", Dr. R. H. Miller; "Selection and Management of Patients for Gastric Surgery", Dr. H. M. Clute; "Acute Perforations of Stomach and Duodenum", Dr. W. R. Morrison; "Results of a Series of Stomach Operations", Dr. E. S. Emery, Jr.

Discussion by Doctors David Cheever, Edward P. Richardson, Frank H. Lahey and I. J. Walker.

January 30, 1929—*General Meeting* in association with Boston Medical Library. "Heredity", Professor George H. Parker, Harvard University.

February 27, 1929—*Medical Section.* "The Newer Knowledge of Nutriment", Dr. Lafayette B. Mendel, (exact title to be submitted later), Yale University Medical School.

March 27, 1929—Meeting in association with Middlesex South District Medical Society. Title and speaker to be announced later.

April 24, 1929—*Annual Meeting.* Speaker to be announced later.

The Medical Profession is cordially invited to attend all these meetings.

Boston Medical Library
John Bartol, M.D., President.
Hilbert F. Day, M.D., Chairman of Committee on Meetings.

Norfolk District Medical Society
M. V. Safford, M.D., President.
F. S. Cruickshank, M.D., Secretary.

Middlesex South District Medical Society
A. W. Dudley, M.D., President.
S. M. Biddle, M.D., Secretary.

Suffolk District Medical Society
Lincoln Davis, M.D., President.
Arthur H. Crosbie, M.D., Secretary.
George R. Minot, M.D., Chairman Medical Section.
Horace Binney, M.D., Chairman Surgical Section.

SOCIETY MEETINGS

October 1-12—The Graduate Fortnight of the New York Academy of Medicine. For complete notice see page 396, issue of August 23.

October 8-12—Clinical Congress of the American College of Surgeons. For complete notice see page 545, issue of September 13.

October 8-13—Clinical Congress of Physical Therapy and Seventh Annual Meeting American College of Physical Therapy. Complete notice appears on page 545, issue of September 13.

October 12-19—Inter-state Postgraduate Medical Association of North America. Detailed notice appears on page 589, issue of September 20.

October 23-24—The autumn meeting of the State Nurses' Association. For complete notice see page 649.

November 9-10—New England Surgical Society, Tenth Meeting. Complete notice appears on page 542, issue of September 13.

December 3-7—Radiological Society Convention. Detailed notice appears on page 712, issue of May 17.

DISTRICT MEDICAL SOCIETIES

Barnstable District Medical Society

Schedule of Meetings: November 1, 1928, February 7, 1929, May 2, 1929.

Berkshire District Medical Society

The especial features of the October meeting will be addresses by Dr. George Crile of Cleveland, Dr. Emil Novak of Johns Hopkins, Dr. Willis Campbell of Memphis, Tennessee, and Dr. Thomas Ordway of Albany, N. Y. A complete program will be published later.

HUGH J. DOWNEY, Secretary.

Bristol North District Medical Society

April 18, 1929—Spring meeting.

Bristol South District Medical Society

Meetings will be held November 7, 1928, and May 2, 1929. Complete notices will appear later.

Essex North District Medical Society

October 17, 1928 (Wednesday afternoon), at 2 P. M.—A joint meeting with Middlesex East and North, and Essex South will be held at Essex Sanatorium at Middleton. (Telephone Danvers 300-W.)

November 1, 1928 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill (Tel. 3430), at 2 P. M.

January 2, 1929 (Wednesday)—Semi-annual meeting at Haverhill, at 12:30 P. M.

May 1, 1929 (Wednesday)—Annual meeting at Lawrence, at 12:30 P. M.

May 2, 1929 (Thursday)—Censors meet at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. (Tel. 3430.)

Franklin District Medical Society

Meeting will be held on the second Tuesday of November, January, March and May.

Middlesex East District Medical Society

The following schedule of meetings has been arranged for the coming year:

October 17—Middleton. (Joint meeting with Essex North and South and Middlesex North.)
November 14—Woburn.
January 16—Wakefield.
March—Reading.
May—Melrose.

Subjects and speakers to be arranged by committees in each city or town.

Middlesex North Medical Society

October 17—A combined meeting with Essex North and South.

The winter meeting will be held the last Wednesday in January.

The annual meeting will be held the last Wednesday in April.

Middlesex South District Medical Society

March 27, 1929—Joint meeting with the Suffolk and Norfolk Districts.

April, 1929—Annual meeting. Definite date to be announced later.

Norfolk District Medical Society

Below are the proposed meetings of the Norfolk District Medical Society for the 1928-29 Season. The schedule below will be adhered to as strictly as possible. The carrying out of the proposed plan will, of course, depend upon the acceptances of invitations extended to the speakers. Minor changes may be necessary.

October 30—Pondville Hospital. Dr. Lyman F. Jones, Superintendent. Inspection, 4 P. M.; Business Meeting at 5:30; Papers by the Staff; Collation.

November 21—Boston Medical Library. In combination with Suffolk District and Middlesex East District Societies. Subject, Physiotherapy—Dr. F. B. Granger.

January 29—Roxbury Masonic Temple. Subject, Treatment of Varicose Veins by the Injection Method—Dr. E. E. O'Neil. Dr. Homans will open the discussion.

February 25—Roxbury Masonic Temple. Dr. W. R. Ohler. Subject to be announced. Discussion to be opened by Dr. A. A. Hornor.

March 29—Roxbury Masonic Temple. Subject and speakers to be announced.

May, 1929—Annual meeting program to be announced.

The Censors of the Society meet November 8, 1928, and May 9, 1929, at the Roxbury Masonic Temple, Warren Street, Roxbury, at 4 P. M., for the examination of candidates.

Norfolk South District Medical Society

October 4—For complete notice see page 649.

Worcester North District Medical Society

October 23, 1928 (Tuesday)—At Gardner State Colony, by invitation. Program by Staff Colony.

January 22, 1929 (Tuesday)—At Henry Heywood Memorial Hospital, Gardner, by invitation. Program by Staff. Annual meeting the fourth Tuesday in April.

BOOKS RECEIVED FOR REVIEW

The Surgical Clinics of North America, August, 1928. Published by W. B. Saunders Company. 971 Pages.

Epilepsy. Edited by William G. Lennox and Stanley Cobb. Published by Williams & Wilkins Company. 197 Pages.

Practical Surgery of the Abdomen. Volumes I and II. Edited by George H. Juilly, M.D. Published by F. A. Davis Company. Volume I, 628 Pages. Volume II, 1275 Pages.

Pocket Medical Formulary. Edited by W. E. Fitch, M.D. Published by F. A. Davis Company. 501 Pages.